



ANNUAL REPORT

ON THE

HEALTH

OF THE

County Borough of Cardiff,

FOR THE YEAR 1896,

BY

EDWARD WALFORD, M.D., D.P.H., Camb.,

MEDICAL OFFICER OF HEALTH.

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CARDIFF:

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1897.

COUNTY BOROUGH OF CARDIFF.

Health and Port Sanitary Committee.

Mayor :

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Chairman :

ALDERMAN T. WINDSOR JACOBS, J.P.

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Cardiff Urban Sanitary Authority.

TOWN HALL,

CARDIFF, *May, 1897.*

TO THE CHAIRMAN AND MEMBERS OF THE CARDIFF
URBAN SANITARY AUTHORITY.

GENTLEMEN,

I have the honour of submitting to you my Report for the year 1896, comprising, in accordance with the General Order of the Local Government Board, dated March 23rd, 1891, a summary of the action taken during the year for preventing the spread of disease, and an account of the sanitary state of the district at the end of the year.

The Report will contain an account of the inquiries made as to conditions injurious to health existing in this district, and of the proceedings in which the Medical Officer of Health has taken part or advised under the Public Health Act, 1875, or under any other Act of Parliament relating to sanitary matters. It will also contain an account of the supervision exercised by him or on his advice for sanitary purposes over places and houses that the Sanitary Authority have power to regulate with the nature and results of any proceedings which may have been taken in respect of the same during the year. The Report will contain the usual tabular statement and statistics relating to the mortality and sickness within the district classified according to diseases, ages, and Localities.

The present municipal area of the Borough of Cardiff comprises 8,409 acres, 108 of which are occupied by the waters of the Docks. Excluding the water area, the density of the population averages 19·5 per acre over the entire Urban District, varying from 59 persons per acre in the Riverside Ward, to 9 in the Grangetown Ward.

The following tables contain extracts from the census reports for 1891, relating to the Borough of Cardiff.

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The following tables contain extracts from the census reports for 1891, relating to the Borough of Cardiff.

TABLE I.—Distribution of the population in the Municipal Wards of the Borough (census 1891).

MUNICIPAL BOROUGH OF CARDIFF.

Borough and Wards.	HOUSES.			POPULATION (CENSUS 1891).		
	Inhabited.	Uninhabited.	Building.	Persons.	Males.	Females.
Ward—Adamsdown ...	2,132	83	...	16,234	9,398	6,836
Canton ...	2,354	96	6	13,166	6,500	6,666
Cathays ...	2,408	25	12	14,523	7,404	7,119
Central ...	2,008	247	9	12,348	6,105	6,243
Grange town ...	1,809	45	97	11,734	5,975	5,759
Park ...	2,587	110	109	14,289	6,754	7,535
Riverside ...	2,873	77	20	14,897	7,359	7,538
Roath ...	1,949	162	31	12,200	5,886	6,314
South ...	1,554	156	13	10,719	5,824	4,895
Splott ...	1,302	85	35	8,805	4,540	4,265
Total ...	20,476	1,086	332	128,915	65,745	63,170

The area of the Urban Sanitary District of Cardiff is as follows :

Parish of St. Mary	2,791 acres.
St. John			
Roath			
Canton			
Total	8,409 ..

According to the Census of April, 1891, the Population and the Number of Houses in each Parish were as follows :—

TABLE II.

Borough and Constituent Parishes.	HOUSES.			POPULATION, 1891.			Population, 1881.
	Inhabited.	Uninhabited.	Building.	Males.	Females.	Persons.	
Canton ...	5,484	180	85	16,425	16,380	32,805	14,797
Roath ...	6,552	367	175	19,884	19,773	39,657	23,096
St. John ...	4,386	218	29	13,060	14,098	27,158	16,614
St. Mary ...	4,054	321	43	16,376	12,919	29,295	23,254
County Borough of Cardiff ...	20,476	1,086	332	65,745	63,170	128,915	82,761

TABLE III. shows the conditions under which the inhabitants of the Borough are housed, giving the number of tenements and the number of persons occupying tenements with less than five rooms. A tenement is defined in the census instructions as “Any house or part of a house separately occupied either by the owner or by a tenant.”

TABLE III.

Total Number of Tenements in the Borough of Cardiff. (Census 1891).	No. of Tenements with	NO. OF OCCUPANTS OF TENEMENTS.											
		1	2	3	4	5	6	7	8	9	10	11	12 or more.
25,353	1 room 570	303	183	55	19	3	5	2	...	...	...	...	...
	2 rooms 3,576	482	1331	872	506	243	94	31	5	7	5	...	...
	3 rooms 1,943	45	408	404	345	286	230	128	56	28	7	4	2
	4 rooms 3,028	48	331	491	554	511	448	306	192	109	27	8	3

TABLE IV.—Conditions as to marriage and ages of males and females in the Urban Sanitary District of Cardiff according to the census of 1891.

		ALL AGES.	UNDER 15 YEARS.	15—	20—	25—	35—	45—	55—	65 AND UPWARDS.
Unmarried	M.	41,001	22,968	6,266	5,836	4,267	1,312	496	234	122
	F.	36,628	23,005	6,051	4,071	2,338	632	281	165	85
Married	M.	22,982	...	27	1,308	7,575	6,792	4,348	2,105	827
	F.	22,672	...	185	2,558	8,237	6,018	3,582	1,586	506
Widowed	M.	1,762	...	...	18	155	289	390	394	516
	F.	3,870	...	...	29	274	522	837	1,018	1,190

VITAL STATISTICS, 1896.

POPULATION.—The population of the Borough in the middle of the year 1896, as estimated by the Registrar General on the basis of the census enumeration, was 162,690, and the rates given in this report have been calculated on this basis.

It must be borne in mind, however, that although these rates are approximately correct, they are based upon estimates of the population between decennial censuses, and that any error which may exist is naturally increased in proportion to the length of time which has elapsed since the last census. The method adopted by the Registrar General of estimating the population of any given area is based on the assumption that the population has gone on increasing since the last census at exactly the same *rate* that it did between that and the previous census.

In a district like Cardiff in which the population is increasing with unusual rapidity, the estimate obtained in this way is probably too low. In this case the rates of mortality calculated on this estimate are necessarily higher than they would be if calculated on an actual enumeration of the population. The results obtained by this method may to some extent be checked by ascertaining the number of inhabited houses for the year, and then multiplying this by the average number of inhabitants in each house. In some cases this may give a more correct result than that obtained in the usual way, but for purposes of calculating rates of mortality it has the disadvantage that they cannot be so readily compared with former reports, or with those of other districts. (The population of the Urban Sanitary District of Cardiff calculated on this basis is estimated to be 169,459 persons.) The population in the Borough, together with the natural increase by excess of births over deaths in each year since 1845, is shown in Table XI.

BOROUGH OF CARDIFF.

TABLE V.—Estimated population to middle of 1896 at Age Periods.

AGE PERIODS.	MALES.	FEMALES.	TOTAL.
0—5	10,996	10,799	21,795
5—10	9,526	9,645	19,171
10—15	8,464	8,590	17,054
15—20	7,942	7,870	15,812
20—25	8,407	8,402	16,809
25—30	8,104	7,572	15,676
30—35	7,086	6,119	13,155
35—40	5,885	5,016	10,901
40—45	4,707	4,035	8,742
45—50	3,800	3,258	7,058
50—55	2,805	2,673	5,478
55—60	1,921	1,813	3,734
60—65	1,528	1,681	3,209
65—70	896	983	1,879
70—75	545	703	1,248
75—80	259	343	602
80 upwards	149	218	367
All Ages.	82,970	79,720	162,690

MARRIAGES.—The total number of marriages registered during the year 1896, was 1,721, corresponding to a rate of 21·1 persons married per 1,000 persons living.

A return of the number of marriages in the Borough of Cardiff, together with the rate of persons married per 1,000 of the population in Cardiff and in England and Wales is given below.

TABLE VI.

Year.	No. of Marriages.	Rate per 1,000 Persons living.
1886	1244	24·6
1887	1322	25·2
1888	1259	23·1
1889	1431	25·3
1890	1440	24·6
1891	1651	17·6
1892	1526	22·4
1893	1447	20·3
1894	1480	19·8
1895	1271	16·3
1896	1721	21·1

BIRTHS.—During the year 1896 the births registered in the Borough were 5,591, of these 2,767 were males, and 2,824 females.

The number of births corresponded to an annual birth-rate of 34·3 per 1,000 compared with 30·7 the rate in the 33 large towns of England and Wales. The birth-rate in England has fallen continuously since its maximum (36·3) in 1876, to a minimum of 29·6 in 1894. In Cardiff it has also declined during the past ten years, although still considerably above the average in the large towns. During each of the years 1885-1889, the birth-rate in Cardiff was higher than that of any of the principal towns.

The influence of the birth-rate on the general death-rate is often misunderstood. It is sometimes assumed that, inasmuch as the rate of mortality of young children is higher than that of all others, except the very aged, the general death-rate will be raised by a high birth-rate, but if this high birth-rate be continued for a number of years, there will be in the population a large proportion of persons between ten and forty years of age, at which period a very low rate of mortality prevails. A continuously high birth-rate will therefore have a tendency to reduce the death-rate

TABLE VIII.—Gives the number of legitimate and illegitimate births, male and female, in each Ward, in Cardiff, and in the Union Workhouse.

WARDS.		Legitimate.		Illegitimate.		Total.		TOTAL.
		M.	F.	M.	F.	M.	F.	
Central	Ward ...	189	165	4	3	148	168	811
South	" ...	148	162	4	3	147	165	812
Cathays	" ...	278	296	3	4	281	900	581
Park	" ...	363	353	3	3	366	356	722
Adamsdown	" ...	224	223	3	3	227	226	453
Riverside	" ...	163	198	2	2	165	200	365
Canton	" ...	390	408	6	7	396	415	811
Roath	" ...	271	253	4	4	275	262	537
Grangetown	" ...	398	402	5	1	403	403	806
Splott	" ...	320	294	2	5	322	299	621
Union Workhouse	" ...	12	2	30	28	42	30	72
TOTAL ...		2,701	2,761	66	63	2,767	2,824	5,591

TABLE IX.—Annual birth-rate in Cardiff compared with that in the large towns during the ten years ending 1896.

33 LARGE TOWNS.		Annual Birth-rate per 1,000 living.									
		1887	1888	1889	1890	1891	1892	1893	1894	1895	1896
London	...	31·6	30·7	30·3	29·1	31·8	30·9	31·0	30·1	30·5	30·2
West Ham	...	...	...	...	...	...	37·0	35·6	34·0	34·3	32·6
Croydon	...	...	...	...	...	...	26·5	26·2	25·0	25·3	25·1
Brighton	...	25·7	23·3	24·4	23·2	26·3	25·5	25·4	25·8	25·6	24·7
Portsmouth	...	36·8	35·8	35·1	33·6	30·1	28·0	28·2	27·6	27·9	27·6
Plymouth	...	31·5	31·7	31·9	31·2	29·8	29·1	29·9	28·8	28·7	28·3
Bristol	...	29·7	29·3	29·2	28·1	30·4	29·6	30·4	28·2	28·9	27·6
Swansea	...	...	...	...	...	...	35·2	35·1	32·3	33·4	30·5
Wolverhampton	...	33·2	32·9	32·4	32·3	34·2	33·7	34·5	34·1	35·4	34·4
Birmingham	...	31·7	30·7	30·9	30·1	34·2	33·3	32·7	31·7	32·4	32·6
Norwich	...	33·9	34·6	33·8	33·0	31·9	30·5	30·9	29·8	31·8	30·8
Leicester	...	32·8	32·7	31·7	30·5	33·9	32·2	32·6	31·5	30·8	30·8
Nottingham	...	33·2	29·9	28·0	24·9	29·9	29·4	30·2	28·6	29·7	28·9
Derby	...	30·0	29·4	28·5	26·9	30·6	31·1	32·2	29·3	29·1	28·0
Birkenhead	...	32·4	30·7	31·2	31·4	33·0	33·4	33·1	30·6	30·7	31·7
Liverpool	...	31·1	29·7	29·2	28·8	34·6	34·7	36·0	35·4	36·9	34·9
Bolton	...	32·5	32·7	32·8	31·4	34·1	32·7	33·1	31·5	32·9	31·3
Manchester	...	35·8	35·3	35·3	34·9	34·1	33·7	33·6	32·0	33·7	33·0
Salford	...	31·9	31·6	29·9	28·8	36·4	35·9	34·7	34·3	35·9	34·9
Oldham	...	31·3	30·1	28·4	27·0	31·1	29·1	28·6	27·2	27·5	27·2
Burnley	...	...	...	...	...	...	34·2	33·9	32·2	32·1	31·0
Blackburn	...	35·7	34·1	34·3	32·5	33·9	31·9	30·9	28·8	30·6	27·7
Preston	...	33·4	37·5	33·1	36·1	36·0	34·3	35·1	32·1	33·4	32·6
Huddersfield	...	27·7	24·6	24·5	22·6	24·4	23·0	23·8	20·2	21·7	20·5
Halifax	...	28·4	28·5	28·0	27·9	26·2	25·9	24·6	23·1	23·4	24·3
Bradford	...	27·7	27·4	26·7	25·6	23·7	27·2	27·7	26·7	26·1	25·5
Leeds	...	33·3	32·6	32·8	33·4	34·1	33·5	32·4	32·2	31·6	30·7
Sheffield	...	32·9	30·7	33·2	32·4	36·6	35·3	34·3	33·4	34·9	34·0
Hull	...	32·8	31·1	32·6	31·3	34·6	35·0	34·2	32·4	34·2	31·9
Sunderland	...	34·6	34·7	36·0	35·5	37·8	37·1	35·6	35·1	35·1	34·2
Gateshead	...	...	...	...	...	...	35·3	36·5	34·2	34·6	35·8
Newcastle-on-Tyne	...	39·1	37·9	38·2	39·3	35·8	34·3	33·7	31·0	31·2	31·1
Cardiff	...	40·8	40·6	38·6	39·3	36·5	35·3	36·0	34·4	34·1	34·3
33 Large Towns	...	...	...	...	...	...	31·9	31·9	30·7	31·3	30·7

DEATHS.—During the year 2,795 deaths were registered in the Borough of Cardiff, of these 1,474 were males and 1,321 were females.

The deaths were equal to 16·8 per 1,000 of the population as compared with 19·5 the average rate in the ten preceding years, The death-rate was lower than in any previous year excepting 1894.

According to the returns of the Registrar General, the death-rate in England and Wales was 17·1 per 1,000 of the population, and this also was lower than the rate in any previous year excepting 1894.

In the 33 large towns of England and Wales the mortality was equal to a rate of 18·9 per 1,000 of the population for the year 1896 as compared with 20·9 the average of the ten years 1886-95.

The following is an analysis of births and deaths registered in Cardiff during the year 1896.

Total Births	...	...	...	...	...	5,591
Rate per 1,000 per annum	...	...	...	...	...	34·8
Total Deaths	...	...	...	...	...	2,795
Rate per 1,000 per annum	...	...	...	...	...	16·8
Rate of Mortality from Zymotic Diseases	...	...	...	...	...	2·2
Died under one year old	...	...	...	...	...	923
Aged 60 and upwards	...	...	...	...	...	464
Of Small-Pox	...	...	...	...	...	3
Measles...	...	...	...	...	...	39
Whooping Cough	...	...	...	...	...	108
Diphtheria	...	...	...	...	...	55
Scarlet Fever	...	...	...	...	...	28
Enteric Fever	...	...	...	...	...	13
Typhus Fever	...	...	...	...	...	—
Influenza	...	...	...	...	...	8
Diarrhoea and Dysentery	...	...	...	...	...	120
Violence	...	...	...	...	...	127
Other Causes	...	...	...	...	...	2,294
Inquest Cases	...	...	...	...	...	240
In Public Institutions—						
Cardiff Infirmary	...	...	...	...	...	110
Hamadryad Hospital Ship...	...	...	...	...	...	12
Sanitary Authority's Fever Hospitals	...	...	...	...	...	31
Cardiff Workhouse	...	...	...	...	...	226

The number of deaths registered in Cardiff during the first quarter of the year, at all ages and from all causes, was 633; of these 333 were males and 300 females.

The 663 deaths, in this quarter, corresponded to an annual death-rate of 15·4 per 1,000 living, as compared with 22·0 the average rate in the first quarters of the five preceding years, and with 19·5 the rate in 33 large towns. The deaths from the chief Zymotic diseases during the first quarter were 54, and were equal to an annual death-rate of 1·32 per 1,000 living, as compared with 2·04 the average rate in the first quarters of the five preceeding years, and with 2·69 the average rate in the 33 large towns. Whooping Cough was the most fatal of the Zymotic diseases. The death-rate from the chief Zymotic diseases varied during the quarter, from 0·76 in Swansea, 0·89 in Brighton, and 0·92 in Preston, to 4·14 in Norwich and 4·42 in Salford.

During the second quarter the number of deaths registered was 629, of these 328 were males, and 301 females. The deaths corresponded to an annual death-rate of 15·4 per 1,000, as compared with 18·0 the average rate in the second quarters of the five preceding years, and with 18·2 the rate in the large towns. The death rates ranged from 14·1 in Brighton, 14·4 in Croydon and in West Ham, to 20·7 in Oldham, 21·1 in Liverpool, and 23·6 in Manchester. Seventy-four deaths were registered from the chief Zymotic diseases, corresponding to an annual death-rate of 1·80 per 1,000, as compared with 2·37 the average rate in the second quarters of the five preceding years, and with 2·06 the average rate in the 33 large towns. The rate varied from 0·80 in Brighton to 4·16 in Salford.

The number of deaths registered during the third quarter of the year was 712, of these 381 were males, and 331 females. The 712 deaths corresponded to an annual death-rate of 17·5 per 1,000 living, as compared with 16·9 the average rate in the third quarters of the five preceding years, and with 19·1 in the 33 large towns. The rates in these towns varying from 13·5 in Croydon, to 23·8 in Salford. The 712 deaths from all causes included 163 from the chief Zymotic diseases, corresponding to an annual death-rate of 4·07 per 1,000, being 0·81 above the average in the third quarters of the five preceding years, and 0·12 below the average rate in the 33 large towns in the corresponding quarter of the year.

In the fourth quarter of the year the number of deaths registered from all causes was 821, of these 432 were males, and 389 females. The deaths were equal to an annual rate of 18·8 per 1,000 as compared with 19·3 the average rate in the fourth quarter of the five preceding years, and with 18·8 the rate in the 33 large towns. The death-rates in these towns ranged from 14·6 in Croydon, to 21·9 in Manchester, and 23·1 in Liverpool. The deaths from the chief Zymotic diseases numbered 75 in the fourth quarter, corresponding to an annual rate of 1·72 per 1,000 living, as compared with 2·45 the average rate in the fourth quarters of the five preceding years, and with 1·74 the average rate in the 33 large towns.

The following Table gives a summary of the Vital Statistics in Cardiff during the years 1887-1896.

TABLE X.

Years.	Births.	Birth-rate per 1,000 Inhabitants.	Deaths from all causes	Death-rate per 1,000 Inhabitants.	Death-rate from the seven Chief Infectious Diseases per 1,000 Inhabitants	Deaths under one year per 1,000 births registered.
1887	4,277	40·8	2,280	21·8	2·6	172
1888	4,409	40·6	2,212	20·3	2·9	143
1889	4,361	38·6	2,190	19·4	2·1	156
1890	4,600	39·3	2,469	21·1	2·4	165
1891	4,739	36·5	2,873	22·0	2·1	153
1892	4,776	35·0	2,560	18·7	2·7	157
1893	5,110	36·0	2,790	19·6	2·8	171
1894	5,100	34·2	2,415	16·2	1·7	187
1895	5,321	34·1	2,840	18·2	2·0	178
1896	5,591	34·3	2,795	16·8	2·2	165

TABLE XI.—Births, Deaths, and Natural Increase of Population for Fifty-two years, 1845—1896.

Year.	Population.	Births.	Deaths.	Excess of Deaths over Births.	Excess of Births over Deaths.
1845	13,385	320	324	4	...
1846	14,212	381	321	...	60
1847	15,039	391	484	153	...
1848	15,866	428	579	151	...
1849	16,693	466	864	395	...
1850	17,520	504	485	...	19
1851	18,354	575	585	...	50
1852	19,724	696	620	...	76
1853	21,094	865	644	...	221
1854	22,464	950	925	...	25
1855	23,834	1,079	641	...	438
1856	25,204	1,227	772	...	455
1857	26,574	1,367	883	...	484
1858	27,944	1,356	753	...	603
1859	29,314	1,336	826	...	510
1860	30,684	1,346	662	...	584
1861	32,054	1,223	837	...	386
1862	32,804	1,267	695	...	373
1863	33,552	1,302	862	...	440
1864	34,300	1,369	932	...	467
1865	35,048	1,382	867	...	515
1866	35,796	1,331	882	...	449
1867	36,544	1,397	873	...	524
1868	37,292	1,387	843	...	544
1869	38,040	1,414	1,005	...	409
1870	38,788	1,406	903	...	503
1871	39,494	1,391	891	...	500
1872	40,206	1,358	916	...	442
1873	40,914	1,430	995	...	435
1874	41,622	1,550	885	...	665
1875	42,330	2,716	1,547	...	1,169
1876	43,038	2,707	1,455	...	1,252
1877	43,746	2,772	1,475	...	1,297
1878	44,454	2,795	1,468	...	1,327
1879	45,162	2,969	1,428	...	1,541
1880	45,870	2,898	1,634	...	1,295
1881	46,578	3,145	1,556	...	1,598
1882	47,286	3,399	1,724	...	1,675
1883	47,994	3,526	1,807	...	1,719
1884	48,702	3,920	2,250	...	1,670
1885	49,410	4,164	2,487	...	1,683
1886	50,118	4,270	2,269	...	2,001
1887	50,826	4,277	2,280	...	1,997
1888	51,534	4,409	2,212	...	2,197
1889	52,242	4,361	2,190	...	2,172
1890	52,950	4,600	2,469	...	2,131
1891	53,658	4,739	2,873	...	1,866
1892	54,366	4,776	2,560	...	2,216
1893	55,074	5,110	2,794	...	2,316
1894	55,782	5,100	2,415	...	2,685
1895	56,490	5,821	2,840	...	2,481
1896	57,198	5,591	2,795	...	2,796

TABLE XII.—Showing age distribution of population, number of deaths, and death-rates at age periods.

Age periods.	Estimated Population 1896.	Number of Deaths.	Annual Death-rate per 1,000.
0—5	21,795	1,306	59.9
5—10	19,171	75	3.91
10—15	17,054	37	2.16
15—20	15,812	58	3.66
20—25	16,809	90	5.35
25—30	15,676	100	6.37
30—35	13,155	94	7.14
35—40	10,901	117	10.7
40—45	8,742	117	13.3
45—50	7,058	110	15.5
50—55	5,478	119	21.7
55—60	3,734	104	27.8
60—65	3,209	129	40.1
65—70	1,879	106	56.4
70—75	1,248	98	78.5
75—80	602	77	127.9
80—upwards.	367	58	155.3

TABLE XIII.—Annual Death-rate per 1,000 of 33 large Towns in England and Wales for the 10 years, 1887—1896 inclusive.

33 LARGE TOWNS.			Annual Death-rate per 1,000 living.									
			1887	1888	1889	1890	1891	1892	1893	1894	1895	1896
London	...	...	19.6	18.5	17.4	20.3	21.4	20.6	21.3	17.8	19.8	18.6
West Ham	...	...	...	...	...	...	...	18.6	18.9	16.2	17.9	16.1
Croydon	...	...	...	...	...	...	...	15.8	16.3	13.2	14.5	14.2
Brighton	...	...	16.9	16.1	15.1	17.8	18.2	19.2	18.4	16.4	18.9	16.1
Portsmouth	...	...	19.5	18.7	18.1	19.6	19.0	18.5	18.2	15.2	17.8	16.6
Plymouth	...	...	22.7	22.3	25.2	22.4	22.5	18.8	21.2	18.3	20.1	19.6
Bristol	...	...	20.4	16.9	17.6	19.2	20.9	19.5	18.9	17.3	18.1	16.9
Swansea	...	...	...	...	...	...	...	20.4	19.6	17.0	18.3	16.8
Wolverhampton	...	...	21.7	20.7	20.6	21.8	24.2	21.5	23.3	20.7	24.4	20.0
Birmingham	...	...	19.7	17.8	18.7	20.7	22.2	20.4	22.2	18.6	20.3	20.8
Norwich	...	...	20.4	20.2	18.3	21.1	19.3	20.0	19.3	18.7	19.3	17.4
Leicester	...	...	19.0	18.3	16.9	17.9	21.7	18.2	20.0	14.7	17.2	16.7
Nottingham	...	...	18.7	17.3	17.0	16.5	19.9	18.7	18.5	17.2	19.0	17.5
Derby	...	...	17.1	16.3	16.3	18.5	19.1	19.3	18.2	15.0	16.7	15.7
Birkenhead	...	...	21.0	17.8	17.8	19.7	20.9	19.6	20.5	18.1	19.5	19.2
Liverpool	...	...	23.7	20.3	21.5	23.6	27.0	24.7	27.3	23.8	28.8	22.7
Bolton	...	...	21.3	21.6	22.0	25.8	21.9	22.8	24.1	18.8	24.0	20.7
Manchester	...	...	28.7	26.1	26.7	30.6	26.5	23.8	24.9	20.4	25.2	22.6
Salford	...	...	22.2	21.1	20.4	22.4	26.0	24.6	24.1	21.0	25.6	22.6
Oldham	...	...	23.8	20.3	20.4	21.2	25.7	22.0	21.0	18.6	22.0	20.3
Burnley	...	...	...	...	...	...	...	20.4	21.9	18.7	23.4	17.5
Blackburn	...	...	25.5	23.9	25.4	23.5	25.8	21.7	23.3	17.9	24.3	17.9
Preston	...	...	27.9	23.9	30.0	27.4	27.3	24.1	26.4	20.8	23.9	20.8
Huddersfield	...	...	23.0	18.5	18.8	19.0	23.0	18.1	17.2	15.8	16.9	16.5
Halifax	...	...	21.0	19.1	21.5	22.5	22.8	19.5	17.4	16.5	19.3	17.3
Bradford	...	...	19.9	17.1	19.1	20.4	22.2	18.0	21.0	17.0	19.9	16.5
Leeds	...	...	21.1	20.6	22.0	22.6	22.9	19.8	22.3	17.9	20.5	18.8
Sheffield	...	...	21.6	20.5	20.8	24.9	23.9	20.8	22.3	17.8	20.5	19.3
Hull	...	...	19.3	16.4	20.2	19.2	21.0	19.6	21.8	17.4	20.8	18.9
Sunderland	...	...	19.7	18.1	22.8	22.7	25.0	20.9	22.5	20.8	21.8	19.8
Gateshead	...	...	...	...	...	...	...	18.9	19.3	17.7	19.6	19.1
Newcastle-on-Tyne	...	...	25.3	20.5	25.1	25.9	23.8	19.7	21.0	18.3	20.5	18.5
Cardiff	...	...	21.9	20.3	19.4	21.1	22.0	18.8	19.6	16.2	18.2	16.8
33 Large Towns	...	...	...	...	...	...	...	20.7	21.6	18.1	20.7	18.9

CORRECTED DEATH-RATE.—TABLE XIV., which is taken from the Annual Summary of the Registrar General for the year 1896, gives the recorded and corrected death-rates in the large towns. In comparing the death-rates of different towns it must be borne in mind that if this comparison be based simply on general death-rates it may lead to erroneous conclusions, as towns differ from each other, often considerably, in respect of the age distribution of their populations.

In order, therefore, to make a more correct comparison of the mortality of different towns, it is necessary to know the difference that exists between them in respect of age and sex distribution (the male death-rate being usually higher than the female death-rate). The Registrar General has given "factors" for the large towns based upon the age and sex distribution, as ascertained by the census. In order to obtain the corrected death-rate in each town he multiplies the recorded death-rate by this factor, the effect of which is to neutralise the disparity and to give rates that would have been recorded in the several towns had their populations been identical, so far as age and sex distribution is concerned with the population of England and Wales.

TABLE XIV.—Recorded and Corrected Death-rates per 1,000 persons living in 33 Great Towns in 1896.

Towns, in the order of their Corrected Death-rates.	Standard Death-rate*	Factor for Correction for Sex and Age Distribution.†	Recorded Death-rate 1896.	Corrected Death-rate 1896.‡	Comparative Mortality Figure, 1896.§
England and Wales ...	19·15	1·0000	17·10	17·10	1000
England and Wales, less the 33 Towns ...	19·45	0·9845	16·01	15·84	926
33 Towns ...	17·71	1·0818	18·91	20·45	1186
Croydon ...	18·97	1·0424	14·22	14·82	867
Brighton ...	18·94	1·0110	16·13	16·81	954
Norwich ...	19·99	0·9579	17·38	16·65	974
Portsmouth ...	18·73	1·0224	16·57	16·94	991
Derby ...	17·86	1·1081	15·65	17·26	1009
West Ham ...	17·75	1·0788	16·07	17·34	1014
Bristol ...	18·38	10·447	16·90	17·66	1033
Leicester ...	17·64	1·0855	16·72	18·15	1061
Swansea ...	17·53	1·0924	16·85	18·41	1077
Cardiff ...	17·16	1·1159	16·84	18·79	1099
Nottingham ...	17·81	1·0752	17·50	18·82	1101
Bradford ...	16·73	1·1446	16·51	18·90	1105
Plymouth ...	19·70	0·9720	19·57	19·02	1112
Huddersfield ...	16·47	1·1627	16·47	19·15	1120
Halifax ...	17·20	1·1133	17·33	19·29	1128
London ...	17·97	1·0656	18·58	19·80	1158
Hull ...	18·23	1·0504	18·91	19·86	1161
Blackburn ...	17·05	1·1231	17·87	20·07	1174
Burnley ...	16·67	1·1487	17·61	20·11	1176
Newcastle ...	17·58	1·0892	18·46	20·11	1176
Gateshead ...	17·83	1·0740	19·09	20·50	1199
Leeds ...	17·28	1·1082	18·75	20·78	1215
Sunderland ...	18·25	1·0493	19·82	20·80	1216
Wolverhampton ...	18·30	1·0464	19·95	20·88	1221
Birkenhead ...	17·42	1·0993	19·19	21·10	1234
Sheffield ...	17·22	1·1120	19·26	21·42	1253
Preston ...	17·42	1·0993	20·76	22·82	1335
Birmingham ...	17·33	1·1050	20·81	23·00	1345
Oldham ...	16·72	1·1453	20·27	23·22	1358
Bolton ...	16·90	1·1331	20·73	23·49	1374
Liverpool ...	17·44	1·0980	22·74	24·97	1460
Salford ...	17·03	1·1244	22·64	25·46	1489
Manchester ...	16·90	1·1331	22·64	25·65	1500

* The Standard Death-rate signifies the death-rate at all ages calculated on the hypothesis that the rates at each of twelve age-periods in each town were the same as in England and Wales during the ten years 1881-90, the Death-rate at all ages in England and Wales during that period having been 19·15 per 1,000.

† The Factor for Correction is the figure by which the Recorded Death-rate should be multiplied in order to correct for variations of sex and age distribution.

‡ The Corrected Death-rate is the Recorded Death-rate multiplied by the Factor for Correction.

§ The Comparative Mortality Figure represents the Corrected Death-rate in each town compared with the Recorded Death-rate at all ages in England and Wales in 1896, taken as 1,000.

TABLE XV.—33 Towns. Birth and Death-rates, and Analysis of Mortality, in the 53 Weeks of 1890. (Tables XV. and XVI. compiled from the Registrar General's Returns).

In this Table, 0 00 indicates that the deaths were too few to give a rate of 0·005: when *no death* occurred, — is inserted.

CITIES AND BOROUGHES.	Total Deaths.				Deaths from								Deaths under 1 Year to 1000 Births.	ANNUAL DEATH RATE per 1,000 living.	
	52 or 53 Weeks ending			Principal Zymotic Diseases.	Small-pox.	Measles.	Scarlat. Fever.	Diphtheria	Whooping Cough.	Typh.	Typhoid.	Violence.			
	30th Dec. 1893.	20th Dec. 1894.	2nd Dec. 1895.												
	53 Weeks ending 2nd Jan. 1897.	2nd Jan. 1897.													
33 Towns	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
London*	30·7	21·6	18·1	20·7	2·86	0·00	0·71	0·22	0·38	0·57	0·79	0·71	167	10·6	67·7
West Ham	30·2	21·3	17·8	19·9	3·14	0·00	0·82	0·21	0·60	0·65	0·72	0·77	161	10·6	63·8
Croydon	32·6	18·9	16·2	17·9	1·90	0·02	0·44	0·21	0·70	0·59	0·81	0·54	165	8·6	60·8
Brighton	25·1	16·3	13·2	14·5	1·94	—	0·56	0·04	0·24	0·52	0·43	0·43	150	7·2	55·1
Portsmouth	24·7	18·4	16·4	18·9	1·63	—	0·45	0·05	0·16	0·26	0·11	0·60	154	8·4	61·6
Plymouth	27·6	18·2	15·2	17·8	2·11	—	0·69	0·11	0·11	0·32	0·15	0·73	154	8·5	63·2
Bristol	28·8	21·2	18·3	20·1	2·90	—	1·04	0·03	0·14	0·19	0·07	0·83	178	9·9	62·1
Cardiff	27·6	18·9	17·3	18·1	1·90	0·02	0·61	0·25	0·16	0·26	0·52	0·68	142	9·0	67·6
Swansea	33·8	19·7	16·2	18·2	2·27	0·02	0·23	0·17	0·37	0·63	0·77	0·84	165	9·1	62·5
Wolverhampton	30·5	19·6	17·0	18·3	1·18	0·02	0·05	0·04	0·10	0·56	0·15	0·25	161	9·1	67·4
Birmingham	34·4	23·3	20·7	24·4	3·11	—	0·10	0·24	0·60	0·35	0·41	1·41	184	10·0	67·9
Norwich	32·6	22·0	18·6	20·3	3·57	—	0·60	0·29	0·53	0·74	1·20	0·66	197	11·4	69·3
Leicester	30·8	19·3	18·7	19·3	2·33	—	1·06	0·04	0·22	0·08	0·74	0·47	164	8·2	56·6
Nottingham	30·8	20·0	14·7	17·2	2·97	—	0·60	0·25	0·32	0·25	1·35	0·57	187	8·2	60·0
Dorby	28·9	18·5	17·2	19·0	2·47	—	0·88	0·11	0·06	0·39	0·69	0·69	168	9·1	64·8
Birkenhead...	28·0	18·2	15·0	16·7	1·91	—	0·33	0·11	0·10	0·52	0·65	0·51	151	8·0	71·8
Liverpool	31·7	20·5	18·1	19·5	2·97	—	1·04	0·29	0·20	0·53	0·68	0·52	177	10·7	68·1
Bolton	34·9	27·3	23·8	28·8	2·27	—	0·48	0·35	0·24	0·46	1·16	1·14	173	13·5	80·8
Manchester...	31·3	24·1	18·8	24·0	2·80	—	0·05	0·33	0·11	0·83	1·09	0·56	168	12·0	87·8
Salford	33·0	24·9	20·4	25·2	3·12	—	1·06	0·37	0·15	0·67	0·94	0·78	176	9·6	121·2
Oldham	34·9	24·1	21·0	25·6	2·91	—	0·94	0·38	0·23	0·88	1·23	0·65	199	12·9	79·7
Burnley	27·2	21·0	18·6	22·0	2·91	—	1·15	0·38	0·24	0·36	1·23	0·47	184	12·5	71·6
Blackburn	31·0	21·9	18·7	23·4	2·19	—	0·60	0·04	0·46	0·27	0·70	0·56	170	9·7	72·6
Preston	27·7	23·3	17·9	24·3	1·82	—	0·31	0·07	0·08	0·36	0·74	0·62	171	9·7	81·5
Huddersfield	32·6	26·4	20·8	23·9	1·86	—	0·03	0·03	0·10	0·37	1·11	0·47	203	10·3	81·3
Halifax	20·5	17·2	15·8	16·9	1·60	—	0·27	0·19	0·21	0·54	0·26	0·41	166	9·3	74·4
Bradford	24·3	17·4	16·5	19·3	1·10	...	0·17	—	0·22	0·46	0·34	0·47	149	9·2	79·3
Leeds	25·5	21·0	17·0	19·9	1·58	0·00	0·46	0·10	0·07	0·45	0·88	0·52	143	9·4	73·7
Sheffield	30·7	22·3	17·9	20·5	2·28	—	0·49	0·17	0·12	0·60	0·21	0·68	169	10·4	74·4
Hull	34·0	22·3	17·8	20·5	2·91	—	0·57	0·23	0·16	0·58	1·02	0·62	173	10·6	69·4
Sunderland...	31·9	21·8	17·4	20·8	3·02	—	1·16	0·25	0·23	0·50	0·90	0·79	173	10·3	66·1
Gateshead	34·2	22·5	20·8	21·8	3·00	—	1·00	0·19	0·06	0·53	0·37	0·85	158	11·8	64·0
Newcastle	35·8	19·3	17·7	19·6	3·10	—	1·37	0·26	0·18	0·35	0·72	0·45	172	10·5	64·7
	31·1	21·0	18·3	20·5	2·08	—	0·64	0·12	0·10	0·48	0·51	0·81	165	10·7	66·5

* See note (f) to Table XIV.

TABLE XVI.—33 Towns.—Death Rates per 1,000 living from all Causes, and from the Principal Zymotic Diseases, and Infant Mortality, in the Ten Years, 1886-95, and in 1896.

In this Table 0·00 indicates that the deaths were too few to give a rate of 0·005; when no death occurred, — is inserted.

Cities and Boroughs.	All Causes.		Small-Pox.		Measles.		Scarlet Fever.		Diphtheria.		Whooping-Cough.		Fever.		Diarrhoea.		Deaths under One Year to 1,000 Births.	
	Ten Years, 1886-95.	1896.	Ten Years, 1886-95.	1896.	Ten Years, 1886-95.	1896.	Ten Years, 1886-95.	1896.	Ten Years, 1886-95.	1896.	Ten Years, 1886-95.	1896.	Ten Years, 1886-95.	1896.	Ten Years, 1886-95.	1896.	Ten Years, 1886-95.	1896.
	1886-95.	1896.	1886-95.	1896.	1886-95.	1896.	1886-95.	1896.	1886-95.	1896.	1886-95.	1896.	1886-95.	1896.	1886-95.	1896.	1886-95.	1896.
33 Towns	20·9	18·9	0·02	0·00	0·60	0·71	0·27	0·22	0·27	0·88	0·55	0·57	0·21	0·19	0·88	0·79	167	167
London*	20·1	18·6	0·01	0·00	0·61	0·82	0·24	0·21	0·41	0·60	0·60	0·65	0·15	0·14	0·70	0·72	155	161
West Ham	18·3	16·1	0·05	0·02	0·66	0·44	0·24	0·21	0·39	0·70	0·67	0·59	0·22	0·23	0·80	0·81	153	165
Croydon	14·5	14·2	0·00	—	0·34	0·56	0·06	0·04	0·32	0·24	0·41	0·52	0·10	0·15	0·49	0·43	132	150
Brighton	17·9	16·1	—	—	0·96	0·45	0·08	0·05	0·18	0·16	0·37	0·26	0·12	0·11	0·68	0·60	151	135
Portsmouth	18·2	16·6	0·01	—	0·51	0·69	0·11	0·11	0·22	0·11	0·96	0·32	0·31	0·15	0·83	0·73	149	154
Plymouth	21·2	19·6	0·01	—	0·52	1·04	0·51	0·03	0·15	0·14	0·45	0·19	0·22	0·07	0·64	0·83	167	178
Bristol	19·2	16·9	0·04	0·02	0·49	0·61	0·26	0·25	0·13	0·16	0·49	0·26	0·12	0·08	0·49	0·52	145	142
Cardiff	19·5	16·8	0·02	0·02	0·35	0·23	0·21	0·17	0·25	0·37	0·47	0·63	0·23	0·08	0·90	0·77	162	165
Swansea	20·1	18·8	0·00	0·02	0·65	0·06	0·60	0·04	0·08	0·10	0·51	0·56	0·26	0·15	0·43	0·25	160	161
Wolverhampton	22·2	20·0	0·01	—	0·55	0·10	0·28	0·21	0·21	0·60	0·45	0·35	0·20	0·41	1·15	1·41	188	184
Birmingham	20·7	20·8	0·05	—	0·52	0·60	0·20	0·29	0·16	0·53	0·55	0·74	0·15	0·21	1·10	1·20	174	197
Norwich	19·6	17·4	—	—	0·38	1·06	0·14	0·04	0·21	0·22	0·49	0·08	0·25	0·19	0·98	0·74	176	164
Leicester	19·2	16·7	0·01	—	0·44	0·60	0·17	0·25	0·09	0·32	0·39	0·25	0·21	0·20	1·55	1·35	202	187
Nottingham	19·4	17·5	0·01	—	0·41	0·88	0·18	0·11	0·07	0·06	0·46	0·39	0·30	0·34	1·03	0·69	171	168
Derby	17·9	15·7	0·02	—	0·41	0·33	0·13	0·11	0·12	0·10	0·41	0·32	0·22	0·20	0·68	0·65	150	151
Birkenhead	19·9	19·2	0·01	—	0·50	1·04	0·26	0·40	0·17	0·20	0·48	0·53	0·32	0·23	0·78	0·68	163	177
Liverpool	26·0	22·7	0·02	—	0·77	0·48	0·50	0·35	0·16	0·24	0·62	0·46	0·37	0·32	1·13	1·16	189	173
Bolton	22·7	20·7	0·01	—	0·82	0·05	0·30	0·33	0·12	0·11	0·60	0·33	0·28	0·39	1·29	1·09	180	168
Manchester	25·6	22·6	0·02	—	0·79	1·06	0·40	0·37	0·26	0·15	0·61	0·67	0·28	0·23	1·10	0·94	185	176
Salford	24·9	22·6	0·01	—	0·87	0·94	0·56	0·45	0·39	0·23	0·71	0·38	0·42	0·33	1·46	1·23	195	199
Oldham	23·9	20·3	0·10	—	0·73	1·15	0·31	0·38	0·20	0·24	0·54	0·36	0·17	0·16	0·63	0·62	178	184
Burnley	21·6	17·5	0·01	—	0·67	0·60	0·37	0·04	0·16	0·46	0·33	0·27	0·28	0·12	1·48	0·70	216	170
Blackburn	24·1	17·9	0·02	—	1·11	0·31	0·50	0·07	0·03	0·08	0·50	0·36	0·28	0·26	1·28	0·74	204	171
Preston	25·9	20·8	0·05	—	0·88	0·08	0·28	0·03	0·15	0·10	0·60	0·37	0·39	0·22	2·14	1·11	232	208
Huddersfield	19·4	16·5	0·00	—	0·54	0·27	0·26	0·19	0·15	0·21	0·38	0·54	0·13	0·13	0·33	0·26	164	166
Halifax	20·2	17·3	0·06	—	0·45	0·17	0·18	—	0·14	0·22	0·27	0·34	0·16	0·21	0·29	0·16	162	149
Bradford	20·3	16·5	0·07	0·00	0·49	0·46	0·32	0·10	0·06	0·07	0·46	0·45	0·17	0·12	0·89	0·38	173	143
Leeds	21·2	18·8	0·01	0·00	0·59	0·49	0·25	0·17	0·09	0·12	0·42	0·60	0·24	0·21	1·13	0·69	177	169
Sheffield	21·6	19·3	0·23	—	0·56	0·57	0·42	0·29	0·14	0·15	0·52	0·58	0·22	0·23	1·18	1·02	173	173
Hull	20·1	18·9	0·02	—	0·43	1·16	0·18	0·25	0·09	0·23	0·39	0·50	0·22	0·38	1·24	0·90	170	173
Sunderland	21·8	19·3	0·01	—	0·57	1·00	0·21	0·19	0·08	0·06	0·44	0·56	0·48	0·37	1·18	0·85	167	158
Gateshead	19·9	19·1	0·00	—	0·53	1·37	0·19	0·25	0·12	0·18	0·58	0·35	0·23	0·22	1·08	0·72	164	172
Newcastle	21·2	18·5	0·00	—	0·54	0·64	0·16	0·12	0·19	0·18	0·53	0·48	0·18	0·15	0·69	0·51	165	165

(See note (f) to Table XIV.)

TABLE XVII.—Gives the population of each year, the annual deaths from all causes, from the seven chief Zymotic diseases, and the death-rates from 1845 to 1896 inclusive, in the Borough of Cardiff.

Year.	Population.	ALL CAUSES.			SEVEN CHIEF ZYMOTIC DISEASES.		
		No. of Deaths.	Death Rates per 1,000.	Mean of 10 years.	No. of Deaths.	Death Rates per 1,000.	Mean of 10 years.
1845	13,385	324	24.2	32.7	51	3.8	9.8
1846	14,212	321	22.6		50	3.5	
1847	15,039	484	32.2		133	8.8	
1848	15,856	579	36.5		186	11.7	
1849	16,693	864	51.7		483	28.9	
1850	17,520	485	27.7		116	6.6	
1851	18,354	525	28.6		81	4.4	
1852	19,724	620	31.4		175	8.8	
1853	21,094	644	30.5		129	6.1	
1854	22,464	925	41.1		353	15.7	
1855	23,834	641	26.9	26.7	665	2.7	5.4
1856	25,204	772	30.6		186	5.3	
1857	26,574	883	33.2		284	8.8	
1858	27,944	753	26.9		128	4.5	
1859	29,314	826	28.1		212	7.2	
1860	30,684	662	21.5		95	3.0	
1861	32,054	837	26.1		100	3.1	
1862	32,804	695	21.2		132	4.0	
1863	33,552	862	25.7		268	7.0	
1864	34,300	932	27.1		250	7.3	
1865	35,048	867	24.7	23.6	161	4.5	3.9
1866	35,796	882	24.6		192	5.3	
1867	36,544	873	23.8		116	3.1	
1868	37,292	843	22.6		109	2.9	
1869	38,040	1,005	26.4		156	4.1	
1870	38,788	903	23.2		133	3.4	
1871	39,494	891	22.5		158	3.9	
1872	40,200	916	22.7		234	5.8	
1873	40,906	995	24.2		103	2.5	
1874	41,612	885	21.2		154	3.6	
1875	42,318	1,547	22.1	20.0	294	4.2	3.3
1876	43,024	1,455	20.8		339	4.6	
1877	43,730	1,475	19.6		255	3.5	
1878	44,436	1,468	18.9		197	2.5	
1879	45,142	1,428	17.6		137	1.7	
1880	45,848	1,634	19.7		306	3.7	
1881	46,554	1,556	18.2		164	1.9	
1882	47,260	1,724	19.4		293	3.3	
1883	47,966	1,807	19.8		253	2.7	
1884	48,672	2,250	21.3		476	5.0	
1885	49,378	2,481	25.5	20.7	521	5.3	2.7
1886	50,084	2,269	22.5		532	3.2	
1887	50,790	2,280	21.8		278	2.6	
1888	51,496	2,212	20.3		324	2.9	
1889	52,202	2,190	19.4		248	2.1	
1890	52,908	2,469	21.1		232	2.4	
1891	53,614	2,873	22.0		272	2.1	
1892	54,320	2,560	18.7		371	2.7	
1893	55,026	2,794	19.6		408	2.8	
1894	55,732	2,415	16.2		257	1.7	
1895	56,438	2,840	18.2		324	2.0	
1896	57,144	2,795	16.8		362	2.2	

INFANT MORTALITY.—The rate of infant mortality as measured by the proportion of deaths of infants under one year of age to 1,000 births registered was 165, as compared with 179 in 1895. In England and Wales the rate of mortality among infants under one year of age to 1,000 registered births was 148, which was also the mean proportion in the ten years 1886-95. In the 33 large towns the average rate was 167, in 67 other towns it was 161, and in the rest of England and Wales it was 130.

The year 1894 was an exceptional year with respect to infant mortality. In England and Wales it was with one exception lower than in any of the previous ten years. In 1893 it was unusually high. But it need hardly be stated that no safe conclusion can be drawn as to increase or decrease in the mean death-rate of infants from the statistics of one year. It is only from the average of successive groups of years that this can be done. In England and Wales infant mortality, measured by the proportion of deaths under one year to 1,000 births registered, was equal to 154 in the ten years 1861-70. In the ten years, 1871-80, it fell to 149, and in the ten years, 1881-90, it still further declined to 142.

The proportion of deaths under one year of age to 1,000 births in Cardiff as compared with the average in the large towns is given in the following Table:—

TEN YEARS.		CARDIFF.		LARGE TOWNS.
1881-90	...	165	...	162
YEAR.				
1891	...	153	...	167
1892	...	163	...	164
1893	...	179	...	181
1894	...	141	...	152
1895	...	179	...	182
1896	...	165	...	167

From Table XVIII. it will be seen that out of a total of 923 deaths under one year, 66 are ascribed to premature birth, 175 to diseases of the Respiratory Organs, 105 to diseases of the Nervous System, and 99 to Diarrhœa.

The figures in Table XV. showing the infant mortality in large towns are (as regards Cardiff) comparatively satisfactory. During the past few years this mortality has generally been below the average in these towns. This one might expect, as one of the most important factors in infant mortality does not exist to any extent in this district, namely:—the employment of young married females in factories, and the consequent neglect of their infants.

It has been demonstrated by Dr. George Reid and others that a high death-rate amongst infants may generally be found in those large towns where the employment of married women in factories prevails. Some of the causes of infant mortality are, however, common to every locality, and are to some extent preventable. The conditions which are uncontrollable and which considerably influence the rate of infant mortality are those connected with climate, especially the temperature of the air and soil. The greatest danger is from heat and not from cold.

It is found that the period of maximum mortality amongst infants is from the fourth week in July to the second week in August, when the deaths are 75 per cent. above the annual mean, this excess being due to the prevalence of Diarrhœal diseases.

TABLE XVIII.

CAUSES OF DEATH.							Number of Deaths under One Year of Age.
Premature Birth	...	...	...	...	...	...	66
Congenital Defects	...	...	...	...	...	...	1
Diphtheria	...	...	...	...	...	...	3
Scarlet Fever	...	...	...	...	...	...	...
Measles	...	...	...	...	...	...	14
Whooping Cough	...	...	...	...	...	...	61
Diseases of Respiratory System	...	...	...	...	...	...	175
„ Nervous System	...	...	...	...	...	...	105
„ Digestive System	...	...	...	...	...	...	127
Diarrhoea	...	...	...	...	...	...	99
Tubercular Meningitis	...	...	...	...	...	...	16
Other Tubercular Diseases	...	...	...	...	...	...	8
Violence	...	...	...	...	...	...	8
Other Diseases	...	...	...	...	...	...	240

TABLE XIX.—Infant Mortality in Cardiff as compared with that of the large towns in England and Wales.

LARGE TOWNS.	Deaths under one year to 1,000 Births registered.						
	Ten Years, 1881-1890.	1891	1892	1893	1894	1895	1896
London	152	154	155	164	143	166	161
West Ham	...	...	153	170	138	168	165
Croydon	...	...	123	155	121	134	150
Brighton	146	137	151	169	138	164	135
Portsmouth	138	139	156	164	131	175	154
Plymouth	169	178	137	169	169	178	178
Bristol	141	146	147	141	150	143	142
Swansea	...	...	175	170	163	178	161
Wolverhampton	166	190	172	208	166	218	184
Birmingham	167	171	166	198	163	183	197
Norwich	155	159	182	195	164	190	164
Leicester	202	214	196	220	162	203	187
Nottingham	171	169	167	170	174	190	168
Derby	145	142	173	156	123	161	151
Birkenhead	149	148	168	196	143	174	177
Liverpool	183	188	181	211	179	210	173
Bolton	175	165	180	199	162	212	168
Manchester	179	192	179	203	160	203	176
Salford	183	194	185	210	174	231	199
Oldham	171	292	177	187	161	190	184
Burnley	...	...	192	223	170	242	170
Blackburn	191	204	198	241	169	236	171
Preston	222	227	216	269	217	248	203
Huddersfield	169	185	150	141	160	158	166
Halifax	161	169	160	173	135	158	149
Bradford	165	181	155	197	145	203	143
Leeds	173	177	169	206	155	191	169
Sheffield	171	170	171	191	157	197	173
Hull	159	172	166	206	142	205	173
Sunderland	158	176	157	188	167	189	158
Gateshead	...	...	154	170	152	186	172
Newcastle-on-Tyne	163	174	151	174	157	186	165
Cardiff	165	153	163	179	141	179	165
Large Towns	162	167	164	181	152	182	167

ZYMOTIC DISEASES.—The 2,795 deaths from all causes included :—

3	Attributed to Small-pox	108	Attributed to Whooping Cough
39	„ Measles	13	„ Enteric Fever
28	„ Scarlatina	120	„ Diarrhœa
55	„ Diphtheria		

The 366 deaths ascribed to these diseases correspond to an annual death-rate of 2·2 per 1,000 persons living, as compared with 2·0 the rate in 1895, and with 2·2 the average rate in the 10 years 1887-1896 inclusive. The death-rate from these diseases in the 33 large towns of England of Wales in 1896 was 2·8, ranging from 1·1 in Halifax and Swansea to 4·1 in Salford.

The number of cases of infectious disease notified during the year was 1,455 as compared with 961 in the year 1895, and with 1,147 in 1894.

The total amount paid by the Sanitary Authority for notifications received from Medical Practitioners under the provisions of the Infectious Disease Notification Act was £166 12s. 6d.

TABLE XX.—Death-rate per 1,000 living from all causes and from the Principal Zymotic Diseases in the 10 years 1886-95 and in 1896 in Cardiff and in the 33 large towns of England and Wales.

				Ten Years, 1886-1895.		Year 1896.	
				Cardiff.	33 Large Towns.	Cardiff.	33 Large Towns.
All Causes	...	...	...	19·5	20·9	16·8	18·9
Small-pox	...	...	...	0·02	0·02	0·02	0·00
Measles	...	...	...	0·45	0·60	0·23	0·71
Scarlet Fever	...	...	...	0·21	0·27	0·17	0·22
Diphtheria	...	...	...	0·25	0·27	0·37	0·38
Whooping Cough	...	...	...	0·47	0·55	0·63	0·57
*Fever	...	...	...	0·23	0·21	0·08	0·19
Diarrhœa	...	...	...	0·90	0·88	0·77	0·79

* Includes Enteric, Typhus, and Simple or Ill-defined continued Fever.

TABLE XXI shows the number of cases of Infectious Disease which came to the knowledge of the Medical Officer of Health during the years 1890-1896.

Previous to the year 1888 no record was kept of the number of cases which occurred in the Borough, owing probably to the absence of any systematic method of notifying the occurrence of diseases of this class to the Sanitary Authority. In the year 1888 a system of voluntary notification was adopted and a fee of 2/6 paid in the case of each notice received from medical practitioners. The results of this system have been recorded in previous reports. In January, 1890, the Infectious Disease Notification Act of 1889 was adopted. By this Act a complete return is obtained of certain diseases, namely: Small-pox, Cholera, Diphtheria, Membranous Croup, Erysipelas, Scarlet Fever, Enteric Fever, Typhus Fever, and Puerperal Fever. The following table gives the returns for the years 1890-1896.

TABLE XXI.

	1890	1891	1892	1893	1894	1895	1896
Small-pox ... ..	...	9	5	4	10	1	45
Diphtheria	63	67	155	462	326	229	296
Croup	9	3	9	17	17	19	10
Scarlet Fever	335	685	1851	816	577	484	874
Enteric Fever	152	130	118	105	62	79	74
Typhus Fever ... ..	...	...	...	41	1	...	1
Erysipelas	45	52	95	152	135	132	134
Puerperal Fever	4	10	12 ^e	24	19	17	21
Total	608	956	2245	1621	1147	961	1455

The method adopted in connection with this notification, and with a view of checking the spread of disease is as follows :—An Inspector is appointed who devotes his whole time to carrying out the instructions of the Medical Officer of Health for dealing with infectious diseases. He is, however, assisted in times of epidemics by the District Inspectors. On the receipt of each notification the premises are visited with as little delay as possible, and enquiries are made respecting the history of the case, and the necessary steps are taken for limiting the spread of the disease. In each case report sheets are filled up, of which the subjoined are samples :—

SMALL POX.

Dates of enquiry	Date and address of any recent case in neighbourhood.
Notified by	Has there been any communication with an infected house, if so, when and where?
Name, age, and occupation of patient	Has patient had Small-pox before; when?
Residence	What evidence of vaccination or re-vaccination?
Date of first symptoms	The washing and mangling, where and by whom done?
Where was patient on the 12th, 13th, 14th, 15th or 16th day before the appearance of rash?	Remarks and probable origin of disease.

ENTERIC OR TYPHOID FEVER.

Dates of enquiry	Whence is the supply of water derived?
Notified by	Whence is the supply of milk derived?
Name, age, and occupation of patient	The washing and mangling, where and by whom done?
Residence	Name and residence of any visitor from where disease exists.
Date of first symptoms	Sanitary condition of dwelling, and immediate neighbourhood, probable origin of disease.
Date and address of any recent case in same street	

SCARLET FEVER.

Dates of enquiry	Date and address of any recent case in same street.
Notified by	The washing and mangling, where and by whom done?
Name, age, and occupation of patient	Whence is the supply of milk?
Residence	Any books from Free Library?
Date of first symptoms	Are parents in receipt of parish relief?
Has child within one week been to school, church, or other assembly, or visited any infected house; if so, when and where?	Sanitary condition of dwelling, remarks, and probable origin of disease.

From these sheets the most important particulars are copied into a register, each particular disease having its own book. From this register it is easy at a glance to ascertain any factor common to several cases, and to trace the relation of the disease to the particular locality in which it occurs.

Printed instructions in the following form are left at the infected houses:—

PRECAUTIONS TO BE OBSERVED IN CASES OF INFECTIOUS DISEASE.

The expression "Infectious Disease" means any one of the following Diseases:—Small-Pox, Scarlet Fever, Typhoid Fever, Typhus Fever, Measles, and Diphtheria.

1. Where Infectious Disease exists in a house no child should be allowed to attend School during the time the illness is in the house and until after disinfection has taken place. In the case of Scarlet Fever and Diphtheria, one clear week must elapse from the date of disinfection at the termination of the case, by the Officers of the Sanitary Authority before the child is allowed to attend School. In the case of Measles and Small Pox, the period must be extended to seventeen days.
2. The patient should if possible be at once removed to the Borough Sanatorium.
3. If treated at home the patient should be isolated from the rest of the inmates, except those who are in immediate attendance, and should be placed in a well-ventilated room at the top of the house. A sheet should be hung up outside the door of the sick room and kept wet with a solution of carbolic acid, $\frac{1}{2}$ -pint to a gallon of water, or with some other recognised disinfectant.
4. All bed and body linen, as soon as removed from the sick person, and before being taken from the sick room, should be first put in a solution of carbolic acid of the above-named strength, or into some other disinfectant, remaining there for an hour, and afterwards boiled in water.
5. All discharges from the patient, especially if the disease be Small-pox, Scarlet Fever, or Typhoid Fever should be received into vessels containing some suitable disinfectant, and should be removed from the sick-room and disposed of without delay.
6. If the disease is Small-Pox, any unvaccinated infant in the house should at once be vaccinated, and all adults and young persons over twelve years of age should be re-vaccinated.
7. The patient cannot be pronounced absolutely free from carrying infection until all peeling has entirely ceased in Scarlet Fever (seldom less than seven weeks from the onset of the disease), and until the crusts and scales have been removed in Small-pox, and the whole of the body has been well bathed. In all cases of infectious disease the patient should have one or more warm baths before putting on clean clothes.
8. The sick room should not be visited by any but those in attendance upon the patient, as the clothing of the visitors is very liable to convey infection.
9. In case of death, the body should be completely enveloped in a sheet steeped in a strong solution of carbolic acid (1-pint to a gallon of water) placed in a coffin, with a pound or two of carbolic acid powder sprinkled over it, fastened down and buried without delay.
10. On the termination of a case, the sick room, the clothing, and everything with which the patient has come in contact, must be thoroughly disinfected: notice should be sent to the Medical Officer of Health, who will send an Inspector to superintend the process of disinfection.

11. Infected clothing, bedding, and other articles must be given to the Inspector, who will cause them to be removed to the public disinfecting apparatus, where they will be disinfected free of charge, after which they should be thoroughly washed at home. Infected clothing should not on any account, or under any pretence whatever, be sent to the laundress, and if clothes are received to wash they should not be received until the house is pronounced free from infection.
12. Books obtained from the Free Library should be handed to the Disinfecter before being returned.

Signed,

EDWARD WALFORD, M.D.,

Medical Officer of Health.

Your attention is particularly directed to the following provisions of the Public Health Act, of the Infectious Disease (Prevention) Act, and of the Factory and Workshop Act, 1895, so far as they relate to the spread of Infectious Diseases :—

Every person who :—

- (1.) While suffering from any dangerous infectious disease wilfully exposes himself without proper precaution against spreading the said disorder in any street, public place, or vehicle, or enters any public conveyance without previously notifying to the driver that he is so suffering.
- (2.) Being in charge of any person so suffering, or exposes such sufferer, or
- (3.) Gives, lends, sells, or transmits, or exposes without previous disinfection, any bedding, clothing, rags, or other things which have been exposed to infection shall be liable to a penalty not exceeding Five Pounds.

Every person who shall cease to occupy any house, room, or part of a house in which any person has, within six weeks previously, been suffering from any infectious disease without having such house, room, or part of a house, and all articles therein liable to retain infection disinfected to the satisfaction of a registered medical practitioner, as testified by a certificate signed by him, or without first giving to the owner of such house, room, or part of a house, notice of the previous existence of such a disease, and every person ceasing to occupy any house, room, or part of a house, and who on being questioned by the owner thereof, or by any person negotiating for the hire of such house, room, or part of a house, as to the fact of there having been within six weeks previously been therein any person suffering from any infectious disease, knowingly makes a false answer to such question shall be liable to a penalty not exceeding Ten Pounds.

Any Local Authority or the Medical Officer of any Local Authority generally empowered by the Authority in that behalf, may, by notice in writing require the owner of any bedding, clothing, or other articles which have been exposed to the infection of any infectious disease, to cause the same to be delivered over to an officer of the Local Authority for removal for the purpose of disinfection, and any person who fails to comply with such a requirement, shall be liable to a penalty not exceeding Ten Pounds.

If any occupier of a factory or workshop, or laundry, or of any place from which any work is given out, or any contractor employed by any such occupier, causes or allows wearing apparel to be made, cleaned, or repaired in any dwelling-house or building occupied therewith, whilst any inmate of the dwelling-house is suffering from Scarlet Fever or Small-Pox then, unless he proves that he was not aware of the existence of the illness in the dwelling-house, and could not reasonably have been expected to become aware of it, he shall be liable to a fine not exceeding Ten Pounds.

Signed,

J. L. WHEATLEY.

Town Clerk.

In the case of children attending school, the headmaster or mistress receives from the Medical Officer of Health a notice of the existence of Infectious Disease, in families attending the particular school ; in this way an effectual check is put upon the attendance at school of children from infected houses.

The notice is as follows :—

SANITARY AUTHORITY.

TOWN HALL, CARDIFF.

To the Headmaster of.....189

SIR,

I have to inform you that.....residing at.....
is now suffering from an infectious disease, and that no child from this house shall be allowed to attend School without producing to you a Certificate signed by the MEDICAL OFFICER OF HEALTH, stating that the infectious premises, &c. have been disinfected by the SANITARY AUTHORITY.

Yours faithfully,

EDWARD WALFORD, M.D.,

Medical Officer of Health.

Preserve this Notice as your Voucher for the exclusion of any child or children.

On the completion of the case, either by recovery or death, disinfection of the premises takes place, and this is effected by the Officers of your Authority, after which process the following Certificate is given :—

CARDIFF URBAN SANITARY AUTHORITY.

Medical Officer of Health's Department.

TOWN HALL, CARDIFF.

I hereby certify that the premises at No..... have been disinfected, and that Children from this house may be allowed to return to School.

EDWARD WALFORD, M.D.,

Medical Officer of Health.

To Mr.....

In the case of adults employed in places of business, or in workshops, etc., a similar process is gone through, notices in these cases being sent to the employer and to the infected house.

TABLE XXII.—STATISTICS OF WARDS.

WARDS.	Population, 1896.	Area in Acres.	Persons per Acre.	Total Deaths.	Death-rate per 1,000.	Seven Chief Zymotic Diseases.		Small-pox.		Measles.		Scarlatina.		Diphtheria.		Whooping Cough.		Typhoid Fever.		Typhus Fever.		Diarrhoea.		Phthisis.		Diseases of Respiratory Organs.		Tuberculosis.	
						Deaths.	Death-rate.	Deaths.	Death-rate.	Deaths.	Death-rate.	Deaths.	Death-rate.	Deaths.	Death-rate.	Deaths.	Death-rate.	Deaths.	Death-rate.	Deaths.	Death-rate.	Deaths.	Death-rate.	Deaths.	Death-rate.	Deaths.	Death-rate.	Deaths.	Death-rate.
...	12,774	478	27	221	17.228	2.19	...	...	...	...	1 0.07	2 0.15	12 0.98	1 0.07	...	...	...	...	...	...	12 0.98	20 1.56	40 3.13	5 0.39	...	...	...	...
Central ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
South ...	10,214	519	19	181	17.718	1.76	...	...	...	...	2 0.19	8 0.29	6 0.58	...	...	...	...	...	...	...	7 0.68	14 1.37	41 4.01	1 0.09	...	...	...	...
Cathays ...	16,528	869	44	228	14.121	1.27	...	4 0.24	...	...	...	2 0.12	3 0.18	...	...	...	...	...	...	...	...	12 0.72	17 1.02	80 3.63	1 0.06	...	...	...
Park ...	24,141	588	45	276	11.447	1.94	...	12 0.49	1 0.04	6 0.24	14 0.57	1 0.04	...	...	...	...	...	...	...	...	18 0.53	14 0.57	67 2.08	3 0.12	...	...	...	...
Adamsdown ...	20,762	1,678	12	399	29.226	1.25	...	...	...	...	1 0.04	1 0.04	16 0.77	1 0.04	...	...	...	...	...	...	7 0.33	25 1.20	72 3.46	3 0.14	...	...	...	...
Riverside ...	18,486	818	59	448	23.936	1.94	...	2 0.10	1 0.05	2 0.10	10 0.54	3 0.16	...	...	...	...	...	...	...	...	18 0.97	56 3.56	70 3.78	5 0.20	...	...	...	...
Canton ...	18,316	449	40	275	15.072	3.98	...	6 0.38	...	30 1.63	10 0.54	...	...	...	...	...	...	...	...	...	26 1.39	17 0.92	58 3.11	...	...	...	...	...
Roath ...	14,630	766	19	191	13.016	1.09	...	...	...	...	1 0.06	6 0.41	...	...	...	...	...	...	...	...	9 0.61	8 0.53	48 3.27	3 0.25	...	...	...	...
Grange town ...	18,517	1,905	9	350	18.984	4.53	3 0.16	14 0.75	22 1.18	5 0.27	20 0.27	5 0.27	...	...	...	...	...	...	...	...	15 0.81	23 1.24	68 3.40	4 0.21	...	...	...	...
Spilott ...	15,096	1,454	10	226	14.918	1.19	...	1 0.06	...	...	3 0.19	11 0.72	2 0.13	...	...	...	...	...	...	...	1 0.06	9 0.59	49 3.24	5 0.38	...	...	...	...

TABLE XXIII. shows the number of Infectious Diseases reported under the Notification Act, and the deaths during each Quarter in the year 1896.

	Small-pox.		Cholera.		Diphtheria.		Croup.		Erysipelas.		Scarlet Fever.		Typhoid Fever.		Typhus Fever.		Puerperal Fever.		Relapsing Fever.		Continued Fever.	
	Deaths.	Cases reported.	Deaths.	Cases reported.	Deaths.	Cases reported.	Deaths.	Cases reported.	Deaths.	Cases reported.	Deaths.	Cases reported.	Deaths.	Cases reported.	Deaths.	Cases reported.	Deaths.	Cases reported.	Deaths.	Cases reported.	Deaths.	Cases reported.
First Quarter	2	85	...	...	5	56	5	8	8	96	2	190	4	9	...	...	3	9	...	...	2	...
Second "	1	9	...	...	9	60	4	1	...	82	4	149	8	18	...	...	...	2	...	...	...	...
Third "	...	...	...	...	14	71	1	1	2	25	10	262	1	24	...	...	...	3	...	...	4	...
Fourth "	...	1	...	...	27	109	5	5	2	41	12	333	5	28	...	...	...	7	...	...	1	...
Total	8	45	...	...	55	296	15	10	7	134	28	874	13	74	...	...	3	21	...	...	7	...

TABLE XXIV.—Mortality from the Principal Zymotic Diseases.

Year.	Mean of Six Years, 1878-1883.		Mean of Six Years, 1884-1889.		Mean of Six Years, 1890-1895.		1896.	
Estimated Population according to Registrar General.	84,723		102,850		188,391		162,690	
Seven Chief Zymotic Diseases.	Deaths.	Death- rate.	Deaths.	Death- rate.	Deaths.	Death- rate.	Deaths.	Death- rate.
Small-pox ...	1-0	0-011	4-8	0-043	0-3	0-240	3	0-018
Measles ...	20-6	0-243	84-8	0-841	55-1	0-397	39	0-239
Scarlatina...	35-3	0-410	38-2	0-389	49-0	0-354	28	0-172
Diphtheria ...	15-3	0-180	20-7	0-208	44-1	0-317	55	0-338
Whooping Cough ...	55-1	0-650	62-5	0-559	65-0	0-469	108	0-663
Fever (Enteric) ...	24-3	0-286	38-2	0-373	19-0	0-137	13	0-079
Diarrhœa ...	73-1	0-859	114-5	0-134	104-1	0-751	120	0-737
Total ...	224-7	2-639	363-2	2-547	336-6	2-665	366	2-246

SMALL-POX.—Three deaths from Small-pox were registered during the year, corresponding to an annual death-rate of 0-018 per 1,000 persons living. Forty-eight cases came to the knowledge of the Medical Officer of Health. Of this number 46 occurred during the earlier part of the year, 38 being notified in the first quarter and eight in the second quarter of the year. One case occurred in November and one in December. Of the 48 persons attacked 4 were sailors, who contracted Small-pox abroad or on board vessels on their homeward voyage. These cases are referred to in the report to the Port Sanitary Authority. The chief incidence of the disease occurred in January and February, 31 cases being notified during these two months. About this time Small-pox was epidemic in Gloucester, from whence it spread to various parts of the West of England and South Wales. The infection was introduced into Cardiff by tramps passing through Pontypool and Newport. Although the outbreak threatened to be of a somewhat extensive character it was easily controlled, as every person attacked was removed without delay to the Small-pox Hospital, and re-vaccination was carried out without difficulty amongst those who were exposed to the infection. In only one instance did the disease spread to any inmate of an infected house after the first case had been removed to the Hospital, and this was in the person of the wife of a man who caught Small-pox towards the end of May. All the susceptible persons in the house were re-vaccinated, but in the case of the wife unsuccessfully, no evidence whatever of the operation being visible on her admission to the Hospital. Concerning the prevalence of the disease during the first quarter of the year, a special report was presented to your Health Committee of which the following is an extract :—

SPECIAL REPORT ON THE PREVALENCE OF SMALL-POX DURING THE FIRST QUARTER OF THE YEAR 1896.

In presenting a report on the recent outbreak of Small-pox, I desire, as far as I am able, in the first place to lay before you a few facts connected with previous appearances of this disease within the Borough of Cardiff. Unfortunately, there are

no records that I can find relating to Small-pox, as it occurred before the year 1887, which contain any information beyond a bare statement of the number of deaths. Bearing in mind, however, that the average mortality at all ages from Small-pox is at the rate of 10 per cent of the cases, it is possible to form from this statement a rough estimate of the number of persons attacked.

The following gives the number of deaths from Small-pox during successive years :—

Years	....	....	1880	1881	1882	1883	1884	1885	1886
Small-pox Deaths	....		1	2	0	1	8	2	1

In the year 1887, 11 deaths occurred and 61 cases came to the knowledge of the Sanitary Authority. It is obvious that unless the disease was of an unusually severe type on this occasion, this does not represent anything like the real number of cases, probably only about one-half. The ages at death in this year were as follows :—

0-5 years.	5-10 years.	10 years and upwards.
2	1	8

No information is given as to the condition of vaccination amongst the persons attacked, but it will be seen that the majority of deaths took place amongst persons over 10 years of age, and who were probably (if vaccinated at all) only imperfectly protected by primary vaccination in infancy.

In 1887, the outbreak lasted from February to November, and until April no attempt was made to isolate the cases in any hospital. Dr. Paine reported that “ the Infectious Disease Hospital, from the nature of its construction and the severity of the weather, did not permit of the removal of cases into it, and it did not become available until April, when the weather ceased to be a difficulty.” After this date 32 cases were removed to it out of 49 which were known to have occurred. The result, therefore, of this imperfect isolation of cases, consequent upon the absence of proper hospital accommodation, was the continuance of the prevalence of Small-pox during the whole of the year 1887. The result is the more marked as the entire outbreak was apparently due to a single case imported into the town from the shipping, all the subsequent cases originating directly or indirectly from this one case.

The following table gives the number of cases of Small-pox reported to the Sanitary Authority and the number of deaths since 1888 :—

Years	....	1888	1889	1890	1891	1892	1893	1894	1895
Cases reported		9	0	0	9	5	4	10	1
Deaths	....	4	0	0	0	1	0	1	0

Fortunately several improvements were made in connection with the Small-pox wards adjoining the Hamadryad Hospital Ship, so that in 1888 and the succeeding year it was possible to remove every case as soon as it became known and in an early stage of the disease, with the result that in no single instance did the disease spread to anyone who had been in contact with the infected persons before their removal to the hospital.

In the year 1895 one case of Small-pox was notified. This occurred in December and was that of a tramp who had probably contracted the disease in a lodging house in Newport. He was discovered in a small lodging house in Halket Street and was removed on December 4th to the Small-pox Hospital at Canton. The inmates of the house, with two exceptions, were re-vaccinated, and did not contract Small-pox. The two persons who were not re-vaccinated disappeared somewhat suddenly in order to escape the operation. Their destination was not known until about a fortnight after their departure, when I received a communication from the Medical Officer of Health for Bristol to the effect that they had arrived in that city, and that one of them had developed Small-pox.

The first cases of Small-pox which occurred in 1896, were amongst inmates of the Cardiff Union Workhouse. On the morning of January 15th, I received a request from the Medical Officer of that Institution to see some cases which he had placed in the isolation ward of the Union Infirmary.

On calling there I found a man, and a boy aged 14 years (Nos. 1 and 2 in Table A), suffering from Small-pox. In both the eruption was well developed and confluent on the face, and the eruptive stage in both cases had advanced to about the fifth or sixth day.

They were removed on the 15th to the new Small-pox Hospital belonging to the Sanitary Authority. The origin of these cases was obscure, but the infection was probably brought into the building by a tramp. No 1. had been in the workhouse since July last, and No. 2 was admitted on December 26th. On January 16th, two more cases were discovered and isolated (Nos. 3 and 4), one a man aged 69 years, and the other a man 53 years of age. In both the disease had advanced to about the sixth day of the eruption. At the same time my attention was called to a man in the Union Infirmary (No. 5) who had been admitted to the workhouse on January 7th, with an eruption of a doubtful nature on his face and body; from his appearance I formed the opinion that he was convalescent from Small-pox, and subsequent events proved this to be the case. These three cases were also removed to the Small-pox Hospital.

Allowing the usual incubation period of twelve days in cases of Small-pox, No. 5 could not have been the means of infecting any of the preceding cases, but he was probably responsible for some of those which subsequently occurred, *i.e.*,—Nos. 6, 8, 9, 10, 11, 13, and 14. These persons were taken ill between the 19th and 23rd January, and were removed to the Small-pox Hospital. On January 27th, 31st, and February 1st, three more cases were notified (cases No. 16, 18, and 19); subsequently seven more cases occurred, the last one on March 2nd (No. 32), making altogether twenty-two Small-pox patients who were removed to the Sanitary Authority's Hospital from the workhouse of the Cardiff Union. During this quarter of the year, Small-pox became epidemic in Gloucester, from whence it was conveyed to Newport and Pontypool, and to several places in South Wales.

From these infected districts the disease was introduced into Cardiff, and the following cases occurred in the town in addition to those already mentioned in connection with the workhouse.

The first case was that of a young woman living in Maria Street, A.K., aged 18 years. On visiting the house on January 16th, in consequence of information received, I found the patient to be suffering from a mild and modified attack of Small-pox. The eruption, which was scanty, was first noticed on the 14th January.

No previous case had been heard of in the house or neighbourhood, but it was known that this girl had visited some lodging houses much frequented by tramps. She was removed to the Small-pox Hospital. The inmates of the house were re-vaccinated, the premises, &c., were disinfected, and no other case came under notice in this street. The case is referred to as No. 7 in the Table.

The next cases heard of in the town occurred in Wells Street, E. E., a female aged 30, and E. B., her Mother, aged 68 (Nos. 12 and 15). They came to my knowledge and were removed to the Small-pox Hospital on January 27th. The eruption in both cases had advanced to about the fifth day, and the disease, which was of a mild and modified type, was contracted from an unvaccinated child in the house, who was supposed by its parents to have recently had chicken pox, but who had undoubtedly caught Small-pox during a visit to Bristol in December. The usual precautionary measures were taken and no further spread of the disease occurred in this house.

On the 31st January, my attention was called by the Medical attendant to a case of Small-pox in Shakespeare Street (No. 17 in Table). On visiting the house I found a young woman, aged 18 years, suffering from Small-pox in a severe form with a well developed eruption, which subsequently became confluent and had advanced to about the third day. The mother of the patient stated that this was the second attack of Small-pox from which her daughter had suffered. No case of Small-pox was discovered in this Street or neighbourhood, and it was impossible to trace the origin of the infection. The patient was removed to the Small-pox Hospital on the 31st. No other case occurred in the house.

On February 5th, three cases of Small-pox were reported. Two of these were sailors attending as out patients the Seamen's Hospital. The other a lad living in Court Road. One of the sailors was living in Chester Place, near Court Road, and one in a Lodging House in Bute Street. These cases are referred to as Nos. 20, 21, and 22. They were removed without delay to the Small-pox Hospital, and no other case occurred in any of these three infected dwellings.

On February 15th, case No. 26 was reported to me. W. F., aged 26, a fitter in the Engine Shed of the Great Western Railway, and living in Albert Street. In this shed were working at the time a considerable number of men from Gloucester and Swindon, and the communication between these places and the Engine Shed at Cardiff was constant. The infection was probably brought from Gloucester where the Small-pox Epidemic was extending. The patient was at once removed to the Hospital and no other cases occurred in the house.

On February 22nd, a case of Small-pox (No. 29) was removed to the Hospital from Market Road. H. C., a man aged 22 years, a mason working in the Corporation Dépôt at Cathays. The origin of the infection in this instance was obscure, but there seemed some possibility of infection from the Union Workhouse. The illness assumed a mild form and no other inmate of the house contracted Small-pox.

On March 1st, I received notice that a man living at the further end of the Cowbridge Road was suffering from Small-pox. On visiting the house I found S. N., aged 36, to be suffering from the disease in a somewhat severe form, the eruption

was well developed and semi-confluent. The man was employed at the Docks as haulier, and frequently came into contact at certain stores with men from Gloucester. He was removed to the Small-pox Hospital and no spread of the infection took place. This case is referred to as No. 31 in the Table.

On March 24th, a man (No. 35), J. M., 36 years of age, was found by his medical attendant to be suffering from Small-pox. This man was living at 39, Rolls Street, and was an engine driver on the Great Western Railway. He had been to Gloucester on March 7th, and on that day only during the past few months. On March 21st, a fortnight after this visit, he was taken ill. He was removed to the Small-pox Hospital on the 24th. No other case occurred in the house.

On March 25th, a case (No. 36) was reported at the Church House, Canton. J. S., aged 40, the wife of the Caretaker of the house. The only explanation of the origin of this case would seem to be that the husband conveyed the infection home in his clothes. He was at work at or near the same stores at the Docks as case No. 31. The woman was removed to the Hospital, and no other case occurred in the house.

On March 27th, my attention was called to a man suffering from Small-pox in the Alexandra Road, W. C., aged 30 (case No. 37). This man was a gardener and worked in his brothers' field, which was immediately adjoining the Small-pox Hospital. He was removed to the Hospital on the above date. There was no spread of infection from this case.

On March 29th, a case of Small-pox was reported at 27, Eyre Street. This man was a guard on the Great Western Railway, travelling between Cardiff and Bridgend. It is not certain at which place he contracted the disease, as the infection had been probably conveyed in many cases to places on the Great Western line from the infected district of Gloucester. This case (No. 38 in the Table) was removed to the Hospital without any spread of the disease to other inmates of the house.

Besides these cases in the town, two other cases of Small-pox were removed to the Hospital from the Docks. On March 9th the Master of the S.S. Knight Bachelor (a large steamer from Bombay with a crew of about sixty Lascars), came ashore to report that he had on board two of these Lascars suffering from some disease which he thought might be Small-pox. This proved to be the case; one man had been taken ill about ten days after the steamer left Bombay, the other, who was sleeping close to him, was attacked about nineteen days after the appearance of the rash in the first case. The whole crew was carefully examined, but no other cases were detected on board. These cases are referred to as Nos. 33 and 34 in the Table.

In connection with these town cases it is satisfactory to note that they were all isolated in the Small-pox Hospital, and that in no single instance was the disease communicated to others after the removal of the patient to the Hospital, and thus what might otherwise have proved a serious epidemic was effectually checked at its commencement. This satisfactory result was, in the first place, due to the efficient arrangements made by your Health Committee for dealing with the outbreak. Ample hospital accommodation having been provided to meet the requirements of the district it was possible to remove every case as soon as it became known.

Secondly, we were indebted to the co-operation of the medical practitioners in the town who, by sending prompt notifications of all cases and of suspicious cases of Small-pox, enabled your Officers to take early precautionary measures.

The Guardians, the Public Vaccinators and Vaccination Officers also did all in their power to assist the Sanitary Authority in checking the spread of the disease, by offering greater facilities for free vaccination and re-vaccination, and by carrying out efficiently the Vaccination Laws. The inmates of infected houses, and as far as possible all persons who had been in contact with Small-pox, were vaccinated or re-vaccinated.

The analysis of the cases in Table A shows that none of those attacked had been re-vaccinated, they were all, therefore, practically unprotected in this respect. The primary vaccination in infancy in some cases may have caused a modified attack, but, as is usually the case, it did not afford complete and lasting protection. It is also shown that only one child under ten years of age was attacked, and that it had never been vaccinated. Vaccinated children under 10 years of age have a practical immunity from Small-pox, the youngest vaccinated person who suffered from Small-pox on this occasion was thirteen years of age. It will be seen also that the un-vaccinated suffered from a much more severe type of the disease, and that one of these died. The other case which proved fatal was that of a man who had been vaccinated in infancy, but who at the time of his attack was suffering from Phthisis in a very advanced stage; Small-pox hastened the end, which was in any case rapidly approaching. I do not, of course, reckon amongst the re-vaccinated those who had submitted to this rite in the Union Workhouse after they had contracted the disease, and a few days before admission to the Small-pox Hospital. The proportion of deaths to cases treated was, amongst the un-vaccinated, 16·5 per cent., as compared with 3·4 per cent. amongst the vaccinated. Early in the month of January I communicated with the Board of Guardians, who are the vaccination authority, and represented to them the desirability of issuing public notices calling the attention of the inhabitants of the Borough to the need of protecting themselves and their children by vaccination. This they readily assented to. At the same time I suggested that additional vaccination officers should be appointed, with a view of discovering evasions of the Vaccination Laws, and of inducing adults to be re-vaccinated. This step, however, the Board did not consider desirable. I, therefore, gave instructions to the Inspectors of the Health Department to make enquiries as to the condition of vaccination in the houses visited by them. The results of these enquiries I forwarded when necessary to the Vaccination Officer. This proceeding shows that however willing one Authority may be to assist another in matters connected with the health of the district greater efficiency would be obtained by unity of control. It is an anomalous position for a Sanitary Authority, which is held primarily responsible for the protection of the community against infectious disease, that the chief preventive measure in the case of Small-pox should be in the hands of another authority.

The present outbreak does not, of course, afford a sufficient number of examples to enable one to discuss to advantage the protection afforded against Small-pox by vaccination. It does, however, afford a certain amount of instruction in this respect. We have seen—

1st.—That amongst the persons who suffered from Small-pox there were no vaccinated children under ten years of age.

2nd.—That the only child under ten years of age attacked with Small-pox was un-vaccinated.

3rd.—That amongst those attacked there were no re-vaccinated adults.

4th.—That amongst the cases over ten years of age six were un-vaccinated, and that they had the disease in a severe confluent form, and that one of these died.

5th.—That the mortality amongst the vaccinated was in the proportion of 3·4 per cent. of the cases, whilst amongst the un-vaccinated the proportion was 16·4 per cent.

6th.—That none of the medical or nursing staff of the hospital who had been re-vaccinated contracted the disease although constantly in contact with it.

In order to realise the importance of these facts we must remember that in the pre-vaccination days of the last century a death-rate from Small-pox alone of 3,000 per million of the population was by no means uncommon, and that this rate has been reduced during the past twenty years to between 80 and 90 per million.

That this decline has been chiefly brought about by the enormous fall in the mortality amongst children, who are alone subject to compulsory vaccination; the first 10 years being, as we know, the term of years during which properly performed infantile vaccination exerts its protective influence against Small-pox.

This was well shown during the epidemic in Sheffield in 1888, and reported on by Dr. Barry, of the Local Government Board, in which over 6,000 cases occurred. He shows that of the children under 10 years of age living in Sheffield during 1887-8 under common conditions of infection :—

The attack rate of the vaccinated was 5 per 1,000.

„ „ unvaccinated was 101 per 1,000.

The death-rate of the vaccinated was 0·09 per 1,000.

„ „ unvaccinated was 44 per 1,000, or in other words, for 100,000 vaccinated children, the rate of Small-pox mortality actually observed in Sheffield gives 9 deaths. For 100,000 unvaccinated children, the rate of Small-pox mortality actually observed, gives 4,400 deaths.

In the same epidemic, in persons over ten years of age, the attack rates in the whole Borough of Sheffield were three in those twice vaccinated, 19 in those once vaccinated, and 94 in the unvaccinated.

Again as showing the protective value of efficient re-vaccination, the following facts may be mentioned :—Out of 734 nurses and attendants at the Metropolitan Asylums' Board Small-pox Hospitals, 79 had had Small-pox prior to admission; of the 655 remaining, 645 had been re-vaccinated, not one contracted Small-pox; whilst every one of the 10 remaining were attacked by the disease.

It is by some advanced that improved sanitation has been the cause of the decline of Small-pox, but it is forgotten by these persons that this could not account for the fact that while the Small-pox death-rate among children under five years of age fell 80 per cent., other diseases fell only 6 per cent. during the same period.

Improved Sanitation, valuable as it is as a means of reducing the general death-rate and the death-rate amongst certain classes of disease, is not competent to explain the peculiarity in the reduction of the Small-pox death-rate, the reduction falling specially amongst vaccinated children. Neither is it competent to explain the fact that whilst the total death-rate from Small-pox at all ages has declined very considerably, the Small-pox rates at the later age periods has risen to some extent. This rise is due to the fact that in pre-vaccination days Small-pox was a disease of childhood, like measles and whooping cough (although more fatal than these diseases) and that most of the adults living were protected by having had the disease while young. This is clearly explained by the Registrar-General in his 43rd Annual Report as follows :—

“Before vaccination came into use few persons escaped having Small-pox at some or other time in their lives. The great majority had it when young, and of these a large proportion died, causing a very high death-rate in the earlier age periods. But those who survived the attack enjoyed a practically complete immunity for the rest of their lives, and as they formed a considerable proportion of the population at the later age periods, the Small-pox death-rate at these periods was very low. But when vaccination came into use, and in proportion as its use became more and more general, the relative conditions of the different age periods as regards immunity were materially altered and partially inverted. Childhood, previously altogether unprotected, now received a very considerable immunity, while the later ages, previously much protected, now had their immunity considerably diminished, and the more so the later the period of life and the more remote therefore the date of vaccination.”

TABLE A.—SMALL-POX, CARDIFF, 1896.—AGE AND SEX INCIDENCE.

AGES.	MALES.		FEMALES.		BOTH SEXES.			BOTH SEXES.		
					VACCINATED.			UNVACCINATED.		
	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.	Percentage Mortality at All Ages.	Recovered.	Died.	Percentage Mortality at All Ages.
0-1 year	...	...	...	...	...	...	...	...	...	...
1-5 years	1	...	...	...	...	...	...	1	...	...
5-10 „	...	...	...	...	...	...	...	...	...	...
10-15 „	2	...	...	...	1	...	...	1	...	...
15-20 „	3	...	2	...	4	...	...	1	...	...
20-30 „	5	...	2	...	7	...	...	...	...	...
30-40 „	6	...	1	...	7	...	...	...	...	...
40-50 „	5	1	...	...	5	1	...	...	...	...
50-60 „	3	1	...	...	3	...	...	...	...	...
60 and upwards	5	...	1	...	4	...	...	2	1	...
Total ...	30	2	6	...	31	1	3·4	5	1	16·5

Analysis of 38 Cases of Small Pox occurring in Cardiff during 1896.—TABLE B.

No.	Name.	Sex.	Age.	Date of Notification.	First Day of Rash.	Removed to Hospital.	Type of Disease.	Result.	Date of Discharge.	Days in Hospital.	Vaccination Date.	Remarks.
1	H. G.	M.	14	Jan. 15th	Jan. 15th	Jan. 15th	Confluent	Recovered	Mar. 23rd	68	Not Vaccinated	Removed from Union Workhouse
2	T. H.	M.	68	" 15th	" 10th	" 15th	Confluent	Recovered	" 23rd	68	Not Vaccinated	Removed from Union Workhouse
3	L. G.	M.	53	" 15th	" 10th	" 15th	Confluent	Died	Jan. 27th	12	Not Vaccinated	Removed from Union Workhouse
4	R. N.	M.	69	" 16th	" 10th	" 16th	Confluent	Recovered	Mar. 23rd	67	Not Vaccinated	Removed from Union Workhouse
5	F. B.	M.	35	" 16th	" 5th	" 16th	Discrete	Recovered	Feb. 4th	19	Infancy	Removed from Union Workhouse
6	J. W.	M.	43	" 23rd	" 21st	" 23rd	Confluent	Died	Jan. 31st	8	Infancy	Removed from Union Workhouse
7	A. K.	F.	18	" 16th	" 12th	" 16th	Discrete	Recovered	Feb. 20th	35	10 years of age	Removed from Union Workhouse
8	W. B.	M.	13	" 21st	" 19th	" 21st	Confluent	In Hospital	"	...	Infancy	Removed from Union Workhouse
9	J. A.	M.	5	" 21st	" 19th	" 21st	Confluent	Recovered	Mar. 23rd	62	Not Vaccinated	Removed from Union Workhouse
10	W. C.	M.	62	" 23rd	" 21st	" 23rd	Confluent	Recovered	" 21st	58	Infancy	Removed from Union Workhouse
11	D. C.	M.	29	" 23rd	" 21st	" 23rd	Discrete	Recovered	" 23rd	60	Infancy	Removed from Union Workhouse
12	E. E.	F.	90	" 25th	" 20th	" 25th	Discrete	Recovered	Feb. 15th	21	Infancy	Removed from Wells Street
13	A. G.	F.	24	" 24th	" 21st	" 24th	Discrete	Recovered	Mar. 24th	60	Infancy and on	Removed from Union Workhouse
14	G. B.	M.	63	" 25th	" 20th	" 25th	Discrete	Recovered	Apr. 11th	77	Infancy [Jan. 21	Removed from Union Workhouse
15	E. B.	F.	68	" 25th	" 20th	" 25th	Discrete	Recovered	Mar. 7th	42	Infancy	Removed from Wells Street
16	G. M.	M.	87	" 27th	" 25th	" 27th	Discrete	Recovered	" 23rd	56	Infancy and on	Removed from Union Workhouse
17	E. M.	F.	18	" 31st	" 27th	" 31st	Confluent	Recovered	" 23rd	52	Infancy [Jan. 28	Removed from Shakespeare Street
18	T. M.	M.	56	" 31st	" 28th	" 31st	Discrete	Recovered	" 9th	38	Infancy	Removed from Union Workhouse
19	W. D.	M.	16	Feb. 1st	" 31st	" 1st	Discrete	Recovered	" 31st	59	Infancy and on	Removed from Union Workhouse
20	W. B.	M.	27	" 6th	Feb. 6th	Feb. 6th	Discrete	Recovered	" 14th	37	Infancy [Jan. 31	Removed from Union Workhouse
21	L. H.	M.	20	" 5th	" 2nd	" 5th	Confluent	Recovered	Apr. 12th	57	Not Vaccinated	Removed from Chester Place
22	H. O.	M.	46	" 5th	" 2nd	" 5th	Discrete	Recovered	Mar. 14th	38	Infancy	Removed from 202, Butte Street
23	H. W.	M.	55	" 8th	" 5th	" 8th	Discrete	Recovered	" 9th	30	Infancy and on	Removed from Union Workhouse
24	R. W.	M.	42	" 10th	" 7th	" 10th	Confluent	Recovered	Apr. 27th	46	Infancy [Feb. 6	Removed from Union Workhouse
25	D. W.	M.	67	" 14th	" 11th	" 14th	Discrete	Recovered	" 11th	57	Infancy	Removed from Union Workhouse
26	W. F.	M.	38	" 15th	" 13th	" 15th	Discrete	Recovered	Mar. 11th	25	Infancy	Removed from Albert Street
27	H. R.	M.	58	" 18th	" 15th	" 18th	Confluent	In Hospital	"	...	Infancy	Removed from Union Workhouse
28	D. D.	M.	41	" 20th	" 16th	" 20th	Discrete	Recovered	Apr. 11th	51	Infancy and on	Removed from Union Workhouse
29	H. C.	M.	22	" 22nd	" 19th	" 22nd	Discrete	Recovered	Mar. 28th	35	Infancy [Feb. 14	Removed from Market Road
30	J. W.	M.	22	" 28th	" 26th	" 28th	Confluent	Recovered	Apr. 27th	29	Infancy	Removed from Union Workhouse
31	S. N.	M.	36	Mar. 1st	" 28th	Mar. 1st	Confluent	Recovered	Apr. 27th	46	Infancy	Removed from 850, Cowbridge Road
32	J. P.	M.	47	" 4th	Mar. 2nd	" 4th	Discrete	Recovered	" 15th	42	Infancy	Removed from Union Workhouse
33	G. S.	M.	27	" 9th	" 1st	" 9th	Discrete	Recovered	" 23rd	46	Infancy	Removed from S.S. Knight Bachelor
34	S. M.	M.	17	" 19th	" 1st	" 19th	Discrete	Recovered	" 23rd	46	Infancy	Removed from S.S. Knight Bachelor
35	J. M.	M.	36	" 24th	Feb. 19th	" 24th	Discrete	Recovered	" 30th	37	Infancy	Removed from 84, Rolls Street
36	J. S.	F.	40	" 25th	Mar. 21st	" 25th	Discrete	Recovered	May 5th	41	Infancy	Removed from Church House, Canton
37	W. C.	M.	32	" 27th	" 22nd	" 27th	Discrete	Recovered	Apr. 30th	34	Infancy	Removed from 88, Alexandra Road
38	J. C.	M.	45	" 29th	" 24th	" 29th	Discrete	Recovered	" 30th	42	Infancy	Removed from 27, Eyre Street

WHOOPIING COUGH.—One hundred and eight deaths were registered from Whooping Cough during the year, as compared with 53 in 1895 and 123 in 1894. The deaths from this disease in 1896 corresponded to an annual death-rate of 0·66 per 1,000 persons living, as compared with 0·57, the average rate in the 33 large towns of England and Wales. The average annual death-rate from Whooping Cough in the 10 years, 1886–1895, was 0·55 per 1,000 of the population in the large towns, and 0·47 per 1,000 in Cardiff for the same period. Of the total number of deaths from this disease during the year 1896, 102 were amongst children under 5 years of age, and 53 were males and 55 females. The highest death-rate (1·05 per 1,000) occurred in the second quarter of the year, and the lowest (0·24 per 1,000) in the fourth quarter. The rates were 0·76 and 0·59 in the first and third quarters respectively.

MEASLES.—Thirty-nine deaths were registered from Measles as compared with 45 in the previous year. The deaths corresponded to an annual death-rate of 0·23 per 1,000 persons living, as compared with 0·71, the average rate in the 33 large towns. The average death-rate from Measles during the 10 years 1886–1895 in Cardiff was 0·45 per 1,000, as compared with 0·60, the rate in the large towns for the same period. The rates per 1,000 of the population in the several quarters were 0·05 and 0·19 in the first and second-quarters, and 0·34 in the third and fourth quarters. Of the total number of deaths from Measles 36 were of children under 5 years of age, and 14 were males and 25 females. In the large towns the mortality from Measles ranged from 0·03 in Preston, 0·05 in Bolton, and 0·06 in Swansea to 1·06 in Norwich and in Manchester, 1·15 in Oldham, 1·16 in Hull, and 1·37 in Gateshead.

As mentioned in previous reports preventive measures are not so successful in arresting the spread of Measles as they are in the case of Scarlet Fever. One reason for this being that in the former disease the infection commences before the rash appears on the skin, and, therefore, generally, before the disease is recognised, and before any means of isolating the patient are taken. Measles is not one of the diseases to which compulsory notification applies, the information which we receive relating to the prevalence of the disease is imperfect and is derived from the death returns, from the voluntary notices from medical practitioners or householders, and from the Managers of the Public Elementary Schools. It is not, therefore, possible to give any but an approximate number of the cases of the disease occurring in the Borough during the year, but taking the proportion of deaths to cases at 2 per cent., which is about the average mortality, this number would be 1,950. The largest number of deaths from Measles occurred in the Grangetown and Park Wards, where the mortality rates were 0·75 and 0·49 respectively. There were no deaths from this disease in the Central, South, Adamsdown, or Roath Wards, and in the other Wards the rates ranged from 0·06 in the Splott, 0·10 in the Riverside, 0·24 in the Cathays, and 0·38 in the Canton Wards.

SCARLET FEVER.—Twenty-eight deaths were registered from Scarlet Fever during 1896, as compared with 8 in 1895. The deaths were equivalent to a death-rate of 0·17 per 1,000 of the population, as compared with 0·22, the average rate in the 33 large towns. The average annual death-rate from Scarlet Fever in the 10 years 1886–1895 was 0·27 per 1,000 in the large towns, and 0·21 per 1,000 in Cardiff for the same period. The death-rate from Scarlet Fever in the large towns ranged from 0·03 in Plymouth, and 0·04 in Croydon, Swansea, Norwich, and Burnley to 0·35 in Liverpool, 0·37 in Manchester, 0·38 in Oldham, and 0·49 in Salford.

The total number of cases notified within the Borough and the deaths registered since the adoption of the Infectious Diseases Notification Act came into force were as follows :—

Year.		Cases Notified.		Deaths.		Mortality Per Cent.
1890	...	335	...	19	...	5·6
1891	...	685	...	35	...	5·0
1892	...	1851	...	87	...	4·7
1893	...	816	...	39	...	4·7
1894	...	577	...	8	...	1·3
1895	...	484	...	8	...	1·6
1896	...	874	...	28	...	3·2

With respect to the season of the year the relation of notifications and deaths was as follows :—

			No. of Notifications.	No. of Deaths.	Mortality Per Cent.
First Quarter	...	...	180	2	1·5
Second Quarter	...	...	149	4	2·6
Third Quarter	...	...	262	10	3·8
Fourth Quarter	...	...	333	12	3·6

The 28 deaths included 19 under 5 years of age (67·8 per cent. of the whole), 7 amongst children between 5 and 10 years of age, and 2 under 30 years of age. There were 12 deaths amongst males and 16 amongst females. Of the total number of cases of Scarlet Fever notified 421 (48 per cent.) were admitted to the Borough Hospital for Infectious Diseases as compared with 43 per cent. in 1895, 31 per cent. in 1894, and with 22 per cent. in 1892.

From the above tables it will be seen that the case mortality, or proportion of deaths to cases notified, exceeded the very low mortality of 1894 and 1895, but was below the average of that of the years 1890-1893. The disease assumed a somewhat severe type in the latter half of the year, and especially amongst the cases removed to the Hospital, where 24 deaths occurred amongst the 455 under treatment, giving a case mortality of 5·2 per cent. as compared with 1·2 per cent. in 1895. The fatality of Scarlet Fever is, of course, greatly influenced by age. Amongst the cases under treatment in the Hospital 143 were under 5 years of age and 312 over 5 years; of the former 15 or 10·4 per cent. died; of those over 5 years of age 9 or 2·8 per cent. died. These results compare favourably with those of the Hospitals of the London Metropolitan Asylums Board, where amongst 81,350 cases of Scarlet Fever admitted during the years 1871 to 1894, 6,490 or 8·0 per cent. died, and where the case mortality under 5 years of age was 17·6 per cent. Scarlet Fever spreads amongst a community in various ways, but chiefly by the healthy coming into contact with the infected sick or with infected articles of clothing, &c. It is evident, therefore, that isolation of those suffering from the disease is the most effectual preventive measure which can be adopted. This can rarely be effected at home with any degree of completeness. Hospital isolation is thus the most reliable means which we have for preventing the spread of the disease. Each case dealt with in this way means the removal of a centre of infection from a susceptible community. It will be interesting, therefore, to note the effect of this measure on the spread of the disease during the past few years.

In the year 1892 an epidemic of Scarlet Fever occurred. The number of cases notified during that year were so numerous (1,851) that your authority was induced to construct temporary hospital accommodation. A small iron hospital

with 24 beds was opened in July. Eighty-seven deaths from Scarlet Fever occurred in that year. Thirteen per cent. of the cases notified were removed to the Hospital. In 1893, 816 cases were notified with 39 deaths; 22 per cent. of the cases were sent to the Hospital. In 1894, 577 cases were notified with 8 deaths; 31 per cent. were removed. In 1895, 484 cases were notified with 8 deaths, and 43 per cent. of the cases were removed to the Hospital. In September of 1895 the present new Hospital was opened with 60 beds for Scarlet Fever. Unfortunately, during the year 1896 the number of available beds in the new Hospital proved insufficient, and a large number of applications for admission were obliged to be refused owing to the want of accommodation, with the result that during the latter part of the year the disease became more prevalent in the town. The extension of the hospital buildings is much needed, and it is with satisfaction, therefore, that I report that the three new wards, the construction of which your Authority has sanctioned, will shortly be commenced in accordance with the plans laid before you in the original design of the hospital.

TYPHOID FEVER.—Thirteen deaths were registered from Typhoid Fever during the year 1896, as compared with fourteen in 1895. The number of deaths was equivalent to a death-rate of 0·07 per 1,000 of the population, as compared with 0·19, the rate in the 33 large towns.

The average annual death-rate from “Fever” in the 10 years, 1886-95, was 0·21 per 1,000 in the large towns and 0·23 per 1,000 in Cardiff for the same period. The number of cases of Typhoid Fever notified within the Borough and the number of deaths registered during each year since the adoption of the Infectious Disease Notification Act is given below:—

Year.	Cases Notified.		No. of Deaths.		Percentage Mortality.	
1890	...	152	...	23	...	15·1
1891	...	130	...	26	...	20·0
1892	...	118	...	24	...	20·3
1893	...	103	...	18	...	17·4
1894	...	62	...	7	...	11·2
1895	...	79	...	14	...	17·7
1896	...	74	...	13	...	17·5

AGE INCIDENCE OF THE DISEASE.

Age Periods.	Cases Reported.				Deaths.	
0—5 years	...	5	...	...	1	
5—10 „	...	12	...	...	1	
10—15 „	...	8	...	...	1	
15—20 „	...	6	...	...	0	
20—25 „	...	12	...	...	2	
25—30 „	...	12	...	...	3	
30—35 „	...	7	...	...	2	
35—40 „	...	4	...	...	0	
40—45 „	...	7	...	...	2	
45—50 „	...	1	...	...	1	
50 upwards	...	—		

The Seasonal Incidence of the Disease upon the various Wards in the Borough and upon the Public Institutions was as follows:—

WARD.	1ST QUARTER.		2ND QUARTER.		3RD QUARTER.		4TH QUARTER.	
	Cases Notified.	Deaths.	Cases Notified.	Deaths.	Cases Notified.	Deaths.	Cases Notified.	Deaths.
Central Ward ...	1	...	2	1	1	...	...	...
South „ ...	1	...	...	...	5	...	...	...
Cathays „ ...	2	...	1	...	2	...	4	...
Park „ ...	1	1	4	...	6	...	4	...
Adamsdown „ ...	1	1	1	...	...	...	...	...
Riverside „ ...	...	...	1	...	...	...	1	...
Canton „ ...	1	...	1	...	...	...	2	...
Roath „ ...	...	...	1	...	2	...	4	...
Grangetown „ ...	...	1	1	1	2	1	5	2
Splott „ ...	1	...	...	...	3	...	4	2
Union Workhouse ...	1	1	2	1	2	...	4	1
Hamadryad Hospital ...	...	...	...	...	1	...	...	...

FEVER MORTALITY.—Death-rates per 1,000 of the Population.

TABLE XXV.

	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.
England and Wales	0·20	0·18	0·18	0·18	0·18	0·15	0·22	0·16	Not yet Published.	...
33 Large Towns...	0·22	0·20	0·20	0·19	0·20	0·15	0·24	0·19	0·20	0·19
Cardiff ...	0·16	0·33	0·25	0·19	0·19	0·19	0·12	0·04	0·10	0·08

Amongst the houses in which Typhoid Fever occurred 18 were found to have sanitary defects of some kind. These were remedied without delay under the supervision of the sanitary officers.

Of the 74 cases notified to the Sanitary Authority during the year 16 were imported into the town from outside the district, and of these four terminated fatally. The low death-rate from Typhoid Fever which has prevailed of late years in Cardiff was maintained during the past year, and was satisfactory evidence of the value of the sanitary improvements in the district. Past records show that the death-rate from the disease in the period 1845-54 was 19 per 10,000 of the population, whereas in 1885-94 it was only 2·6, and during the years 1893-96 it averaged 0·8 per 10,000.

From the subjoined Tables it will be seen that with an increasing population the number of cases of this disease notified decreased from 152 in 1890 to 74 in 1896. That the mortality from Typhoid Fever in Cardiff compares favourably with that in England and Wales generally is shown by the Registrar General's last published Annual Report (the 57th). This gives the death-rate per 1,000,000 of

the population from Typhoid Fever as 159 in England and Wales, and as 164 in the whole of South Wales as compared with 50 in Cardiff, or excluding Cardiff from South Wales, as 182 per 1,000,000 against 50. That is, in Cardiff with a population in 1894 of 148,890 there were 7 deaths from Typhoid Fever, whilst in the rest of South Wales with a population of 961,311 there were 175 deaths during the same period. Typhoid Fever is essentially a filth disease and is more particularly associated with the pollution of water supplies. It is not generally held to be a disease which is readily communicable by personal contact, but of late years a considerable amount of evidence has been brought forward in support of its infectivity. The circumstances connected with the spread of the following cases, which have recently come under my observation, seem to indicate that the infection may be contracted very easily by healthy persons visiting the sick, and that strict isolation in these cases is necessary:—

On July 24th, 1896, a case of Typhoid Fever was notified in a house in Upper George Street. C. P., aged 15 years, during her convalescence three other members of the same family were attacked with the same complaint. On January 14th, 1897, four cases of Typhoid were notified at a house in Sophia Street. The persons attacked belonged to a family who had removed from next door to the infected house in Upper George Street, and were frequent visitors to the house during the illness of the inmates. Further, on January 28th three other cases were notified in the same house, lodgers, K. H., about 35 years; A. H., about 1½ years; and H. H., 3 years. On February 15th three cases occurred in the same street (Sophia Street) amongst the family of the brother of the person whose children were first attacked, and who had been in frequent communication with their relations. Again, in another house in Sophia Street a girl, E. E., aged 20 years, who had visited both the infected houses, was attacked about March 3rd.—Another sequence of cases is equally suggestive. On September 3rd, 1896, a case of Enteric Fever occurred in Castle Road. W. F., aged 25 years, came home ill from Sunderland, where he had been staying for some time. During his convalescence J. F., aged 18 years, and H. F., about 25 years, his brothers, were taken ill, and at the same time the members of the family of another brother living in Partridge Road—J. F., aged 27, and E. F., aged 3 years—both had visited the infected house in Castle Road during the illness. These persons also apparently communicated the disease to their servant. In none of the houses in which these cases of Typhoid occurred were any defects of sanitation found to which the development of the disease could be attributed.

DIPHTHERIA.—Fifty-five deaths were registered from Diphtheria during the year 1896 as compared with 46 in 1895 and 59 in 1894. The number of deaths was equivalent to an annual death-rate of 0·33 per 1,000 of the population as compared with 0·38, the average rate in the 33 large towns. In these towns the Diphtheria rate ranged from 0·06 per 1,000 in Nottingham and in Sunderland, 0·07 in Bradford and 0·08 in Blackburn, to 0·46 in Burnley, 0·53 in Birmingham, 0·60 in London and in Wolverhampton, and 0·70 in West Ham. In Cardiff the average annual death-rate from Diphtheria during the decennial period 1886-95 was 0·25 as compared with 0·27 the rate in the large towns for the same period. The number of cases of Diphtheria reported to the Sanitary Authority in 1896 was 296. The case mortality, or the proportion of deaths to cases notified, was equal to 19 per cent.

The local and seasonal incidence of the disease, and also the age periods of the attack in cases reported, is shown in the following Tables :—

TABLE XXVI.

Wards.				Cases reported per 1,000.	Death-rate per 1,000.
Central	Ward	...	...	0·54	0·15
South	"	...	...	0·68	0·29
Cathays	"	...	...	2·17	0·12
Park	"	...	...	1·90	0·24
Adamsdown	"	...	...	0·76	0·04
Riverside	"	...	...	1·40	0·10
Canton	"	...	...	2·02	1·63
Roath	"	...	...	1·57	0·06
Grangetown	"	...	...	0·86	0·27
Splott	"	...	...	2·05	0·19

TABLE XXVII.—The following Tables show the age periods of the cases reported, and the percentage of cases at age periods in each Ward :—

Cases of Diphtheria reported during the year 1896.

Age Periods.	First Quarter.	Second Quarter.	Third Quarter.	Fourth Quarter.	Year.
Under three years ...	4	13	12	12	41
Three and under thirteen ...	32	30	44	63	169
Thirteen and under twenty-five	14	11	6	22	53
Twenty-five and upwards ...	6	6	9	12	33
Total ...	56	60	71	109	296

TABLE XXVIII.—Percentage of Cases at age periods to cases reported in each Ward.

WARD.	Total Number of Cases of all Ages.	Under Three Years' Percentage.	Three and under Thirteen Percentage.	Thirteen and under Twenty-five Percentage.	Twenty-five and upwards Percentage.
Central	5	20.0	60.0	...	20.0
South	7	44.2	28.4	14.0	14.0
Cathays	86	11.1	50.0	25.0	11.1
Park	46	8.6	52.1	26.0	8.6
Adamsdown	16	6.2	37.5	25.0	31.2
Riverside	26	15.8	69.2	11.5	3.8
Canton	95	14.7	70.5	8.4	6.8
Roath	18	27.7	38.8	4.2	2.1
Grangetown	16	18.7	56.2	12.5	12.5
Splott	31	12.9	46.1	25.8	16.1

From the foregoing Tables it will be seen that the number of cases of Diphtheria reported to the Sanitary Authority during the year was slightly in excess of the number reported in 1895, being 296 against 229 in the previous year. Also that nearly 60 per cent of the cases were amongst children between the age of 3 and 13 years—that is, at ages during which they would be generally attending school. In previous reports I have alluded to the influence of school attendance on the spread of this disease, and during the past year a striking example was afforded in an outbreak which occurred in the Canton Ward in August and September, when out of a total of 42 cases reported in that Ward during a single fortnight, 24 were found to be attending a particular school, and out of 7 deaths during the same period 6 were amongst scholars of that school. Taking into consideration all the circumstances connected with this outbreak, I thought it advisable that the school should be temporarily closed. Acting upon my advice and in accordance with the Education Code of 1896, the Sanitary Authority issued a notice requiring the Managers to close the said school for one month from the 17th September. The important part played by personal infection in the spread of Diphtheria, as shown by the influence of school attendance, does not, of course, exclude other factors which may tend to produce a susceptibility to the disease. I have alluded elsewhere to the influence of sewer emanations, but amongst the conditions which have been noticed to be connected with Diphtheria prevalence may be mentioned dampness of soil upon which dwellings are built. Several of the cases reported (24) occurred in newly-built houses, in streets which had not yet been taken over by the Sanitary Authority, and which were consequently not macadamized. The roads were at times in an impassable state owing to the mud and stagnant water on the surface. It is probable that this condition may have in some degree contributed to the illness in these houses, although the incidence of Diphtheria does not appear to have been greater in these localities than elsewhere. Taking the number of cases in these streets as 24 and the population, estimated by the number of inhabited houses, as 2,168, the proportion of cases reported to the population would be 1.1 per 1,000. On referring to Table 23 it will be seen that this is by no means above the rates in the various Wards in the town.

DIARRHŒA.—The deaths from Diarrhœa numbered 120 as compared with 158 in 1895. The deaths registered were equal to an annual death-rate of 0·73 per 1,000 of the population as compared with 0·79, the average rate in the large towns of England and Wales. The average annual death-rate from Diarrhœa in the 10 years 1886-95 was 0·88 per 1,000 in the large towns and 0·90 in Cardiff for the same period. In these towns the lowest rates in 1896 were 0·16 in Halifax, 0·25 in Swansea, and 0·26 in Huddersfield. The highest were 1·16 in Liverpool, 1·20 in Birmingham, 1·23 in Salford, 1·35 in Leicester, and 1·41 in Wolverhampton.

The distribution of the diarrhœa deaths in Cardiff according to the season of the year and the various age-periods was as follows during the year 1896 :—

TABLE XXIX.

DEATHS FROM DIARRHŒA.	1ST QUARTER.	2ND QUARTER.	3RD QUARTER.	4TH QUARTER.	YEAR.
Under One Year	6	5	88	5	99
One and under five	1	1	12	1	15
Five and under fifteen ... ..	...	...	...	...	...
Fifteen and under twenty-five ... ..	...	...	...	...	...
Twenty-five and under sixty ... ..	...	...	2	...	2
Sixty years and upwards	1	...	3	...	4
Total... ..	8	6	100	6	120

As usual the majority of deaths occurred during the third or summer quarter of the year and amongst young children. In this quarter one hundred deaths were registered from Diarrhœa, and of these eighty-three occurred amongst children under one year of age. The deaths from Diarrhœa in this quarter corresponded to an annual rate of 2·45 per 1,000, as compared with 2·15 the average rate in the third quarters of the ten years, 1887-96. In the 33 large towns the rate averaged 2·50 per 1,000 ranging from 0·34 in Halifax, 0·81 in Swansea, and 0·84 in Huddersfield, to 3·41 in Liverpool, 3·43 in Salford, 3·77 in Birmingham, 4·36 in Wolverhampton, and 4·67 in Leicester. The relation between the temperature of the air and the prevalence of Diarrhœa is shown in the following table which gives the Diarrhœal death-rate and mean temperature in Cardiff during the third quarters of ten years, 1887-1896.

TABLE XXX.

YEAR.	DEATH-RATE FROM DIARRHŒA.	MEAN TEMPERATURE.
1887	2·8	58·8
1888	1·4	57·6
1889	1·7	59·0
1890	2·9	59·7
1891	0·8	57·8
1892	2·3	60·4
1893	2·5	61·8
1894	0·5	57·0
1895	1·0	59·5
1896	2·4	58·9

TABLE XXXI.—The following Table shows the distribution of mortality from the Seven Chief Zymotic Diseases, from Phthisis, from diseases of the Respiratory Organs, and from Other Causes in each Street in the Borough during the year 1896.

CENTRAL WARD.

NAME OF STREET.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhoea.	Phthisis.	Respiratory Disease.	Other Causes.	Total.
Bridge and Little Bridge street	1	1	6	8
Blackweir	2	2
Baker's row	2	2	4
Bute Street and terrace	1	...	...	...	...	2	1	5	9
Caroline street	1	...	2	3
Church street	1	1
Cross street	1	...	...	...	1
Corbett road	1	1
Custom house street	1	1
Charles street	3	3
Canal street	1	...	...	1	1	4	7
Carpenters' arms court	2	2
Castle street and arcade	1	...	...	...	...	...	1	2
David street	1	...	...	...	2	3	6
Dumfries place	1	1
Eisteddfod street	1	...	...	1	4	6
East terrace	1	...	1
Edward street and terrace	1	...	...	...	2	3	6
Ebenezer street	1	1
Frederick street	2	...	2	2	3	8	17
Gulliver's court	1	...	1
G.W.R.	1	1
Havelock street	1	1	1	3	6
Homfray street	1	5	6
Jenkins' court	1	1
Hill's terrace	1	...	1	...	1	2	5
Harris' court	1	...	1
Kingston court	1	...	...	1
Love lane	2	8	10
Little Frederick street	1	1
Millicent street	2	...	1	...	2	8	13
Mill lane...	1	1
Mary Ann street	2	2	2	6
Nelson terrace	1	...	1
New street	1	1
Nazareth house	2	...	6	8
North road	2	2
Park place	1	...	...	3	4
Paradise place	1	1
Pembroke terrace	1	1
Park street	1	...	...	1	2	1	5
Plymouth street	1	1	2
Queen street	1	4	5
Old barracks	1	1
Raven street	2	2
Rodney street	2	...	...	1	...	1	4
Rowe's square	1	...	...	...	...	...	1
Rowlands' buildings	1	1
Scott street	1	2	4	7
St. John's square	1	1
St. Mary street	1	...	...	...	...	...	6	7
Stanley street	1	...	2	...	3
Stacey court	1	...	...	...	1
Spring gardens court	1	1
St. Andrew's place and crescent	1	1	2
T.V.R.	1	1
Tredegar street	1	2	3	6
Union buildings	1	...	...	2
Union street	2	1	1	3	7
Williams' court	1	...	...	...	1
Wood street	2	2
Working street	1	...	...	1
Windsor place
Westgate street	1	1
Vachell's terrace	1	1	2
West wharf	1	1	2
Total	1	2	12	1	12	20	40	133	221

SOUTH WARD.

NAME OF STREET.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhoea.	Phthisis.	Respiratory Diseases.	Other Causes.	Total.
Angelina street	1	...	3	4
Alice street	3	...	3
Adelaide street and place	1	...	...	...	2	3	6
Bute street	1	4	10	15
Bute ship yard	1	...	...	...	...	...	1
Bute lane...	1	...	1
Bute esplanade	1	1
Canal wharf	2	2
Christina street	5	5	10
Crichton street and place	1	...	...	...	...	...	1	4	6
Canal	1	1
Crawshaw street	1	1
Canal Parade	2	2
Dudley street and place	1	...	1	2
Exchange	1	1
Eleanor street	1	...	...	...	...	1	4	6
Evelyn street	1	...	1	1	2	4	9
Francis street	2	2	4
George street	1	3	4
Hannah street	1	1
Harrowby street	2	...	...	2	4
Hodges row	5	5
Herbert street	2	4	6
Harpur street	1	1
Henry street	1	...	...	2	3
Havannah ship	2	...	2
Hamadryad hospital	1	1	10	12
James street	1	...	...	...	...	...	1	2
John street	1	...	...	1	2
Louisa street	1	2	3
Loudoun square	1	...	2	3
Mount Stuart square	1	...	2	3
Margaret street	1	2	2	5
Maria street	3	3
North church street	1	...	1	2
Nelson street	1	...	1
Old sea lock	1	1
Pomeroy terrace	1	...	1
Penarth road and terrace	2	...	...	1	...	...	3
Peel street	1	1	4	6
Patrick street	1	...	...	1	...	1	2	5
South church street	1	...	...	1
Sophia street	1	...	1	...	...	...	2	4	8
South Loudoun place	1	...	1
Stuart street	2	...	3	5
South William street	1	1
Windsor esplanade	1	1
West wharf	2	2
West church street	2	1	3
Windsor hotel	1	1
T. V. R., Docks	1	1
Tresillian Terrace	1	...	2	1	4
Total	2	3	6	...	7	14	41	108	181

CATHAYS WARD.

NAME OF STREET.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhoea.	Phthisis.	Respiratory Diseases.	Other Causes.	Total.
Alexander street	1	1	2
Barracks	1	4	5
Cathays yard	1	1
Cairns street	3	6	9	18
Coburn street	1	...	...	...	...	...	2	5	6	14
Crwys road	2	...	3	5	10
Cathays terrace	1	...	...	3	3	13	20
Cranbrook street	1	...	...	...	1
Catherine street	1	1	2
Dalton street	1	...	1
Daniel street	1	1	3	5
Darran street	1	2	3
Fanny street	1	...	...	...	...	2	3
Fitzroy street	2	2
Flora street	2	1	...	4	7
Florentia street	1	...	...	1	2
Gower street	1	1
Glynhonda street	2	...	...	...	2
Gwynneth street	1	...	...	...	...	...	...	...	...	1
Hirwain street	1	...	1
Harriett street and place	1	1	...	...	1	1	2	6
Llanbledian gardens	1	1
Llandough street	1	2	3
Llantrissant street	2	3	5
Llanishen street	1	1
Letty street	1	...	1
Llantwit street	1	1
Minnie street	3	4	7
Manor street	1	1
Miskin street	2	6	8
Minister street	1	1	2
Mundy place	3	1	4
May street	1	...	3	7	11
Merthyr street	1	3	4	8
Norman street	1	1
Richard street	1	...	...	...	...	1	7	9
Rhymney terrace	1	...	1
Ruthin gardens	1	...	...	...	...	...	...	...	2	3
Robert street	4	8	12
Spencer street	1	1
Salisbury road	1	...	...	...	...	...	1	1	4	6
Thesiger street	1	1	9	11
Talygarn street	1	...	1	3	5
Treherbert street	1	...	1	...	2
Treorkey street	1	2
Upper George street	1	2	2	3	8
Woodville road	1	2	5	8
Whitchurch terrace	1	2	3
Total	4	...	2	3	...	12	17	60	135	233

PARK WARD.

NAME OF STREET.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhoea.	Phthisis.	Respiratory Diseases.	Other Causes.	Total.
Alfred street	1	...	4	5
Albany road	1	1	...	...	...	1	4	7
Arran street	1	...	...	...	1	7	9
Angus street	1	...	...	...	...	...	...	2	1	4
Arabella street	1	1	1	1	...	1	1	...	8	14
Braevil street	1	...	1	...	2
Bangor road	1	1
Byron street	2	...	...	...	1	2	5
Bedford street and place	2	1	7	3	13
Castle road	1	...	...	3	4	7	15
Cyfarthfa street	1	...	...	...	8	5	14
Crwys road and place	2	...	...	3	5
Croft's street	1	1
Clive place	1	1
Convent	1	1
Donald street	2	...	1	...	1	1	...	4	10	19
Diana street	2	...	1	...	...	5	8
Elm street	2	...	1	3
Essich street	1	...	...	...	...	...	1
Glenroy street	2	1	3	6	12
Gordon road	1	1
Inverness place	1	3	11	15
Kineraig street	2	2
Keppoch street	2	...	1	...	...	2	...	4	4	13
Lily street	1	...	...	...	...	...	...	1	1	3
Montgomery street	1	...	3	4
Moy road	2	...	...	...	...	...	...	3	4	9
Milton street	1	...	...	1	2	6	10
Northcote street	1	...	1
Mackintosh place	1	...	...	...	...	...	...	3	2	6
Newport road	1	2
Oxford street	1	...	...	1	2	3	7
Parade	1	1
Plasnewydd road	1	...	...	...	...	1	...	1	3	6
Russell street	1	...	...	...	...	...	3	4
Rose street	2	2
Richmond road and crescent	2	9	11
St. Peter street	1	...	...	...	...	...	3	4
Southey street	1	1
Strathnairn street	1	...	...	1	...	...	...	2	6	10
Shakespeare street	1	...	...	...	3	2	6
Treharris street	1	4	5	10
Talworth street	1	1	2
Wellfield road	1	1
Walk	2	...	2
Wordsworth street	1	1
Woodland place	1	1
Total	12	1	6	14	1	13	14	67	148	276

ADAMSDOWN WARD.

NAME OF STREET.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhea.	Pathosis.	Respiratory Diseases.	Other Causes.	Total.
Augusta street	3	3
Adam street	1	...	1	5	7
Adamsdown square	1	1	2
Adamsdown place	1	...	1
Bute Railway	1	1
Buzzard street	1	1	5	7
Bristol Channel	2	2
Cycle street	1	1
Comet street	1	...	...	...	1	3	5
Cumnock place and terrace	1	1
Clifton street	1	...	1	1	3
Cumrae street and place	1	...	...	...	...	3	4	8
Clyde street	1	1
Constellation street	1	...	...	1	2	5	9
Copper street	1	1
Duffryn street	3	2	5
Davis street	1	...	1	3	5
East Dock	10	10
Eclipse street	1	4	5
Ellen street	1	...	2	3	3	6	15
Galston street	1	2	3
Garth street and court	1	1	3	5
Gold street	1	1
Godfrey street	3	...	...	1	...	5	9
Gwendoline street	2	2
Hill's Dry Dock	1	1
Howard place	2	2
Inchmarnock street	1	1	...	...	1	2	5
Ivor street and place	1	...	...	...	...	3	4
Iron street	1	...	1	2
Infirmery...	2	8	100	110
Kingarth street	1	1	2
Kerryceoy street	3	3
Kilcattan street	1	...	2	2	5
Kite street	1	1
Longcross street	2	1	3
Metal street	1	1	1	3
Lead street	1	2	3
Moon street	1	...	...	3	4
Lady Margaret terrace	1	...	...	...	...	...	1
Moirs street, place, and terrace	1	10	11
New Dry Dock	2	2
Meteor street	4	4
Morgan street	2	2
North William street	1	4	11	16
North Luton place	1	1	2
Newport road	1	1	2
Orbit street	1	1	2
Pellet street	1	...	2	3
Planet street	3	3
Platinum street	3	3
Pendoylan street	1	...	4	...	...	...	3	2	10
Prince Leopold street...	2	...	...	2
Rosemary street	1	...	2	3
Roland street	1	...	...	2	2	3	8
Roath Dock	3	3
Roath Basin	2	2
Sanquahar street	1	1	4	6
South Luton place	1	...	...	...	1	...	2
Sandon place	5	5
System street	2	1	1	4

ADAMSDOWN WARD—Continued.

NAME OF STREET.		Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhea.	Pneumonia.	Respiratory Organs.	Other Causes.	Total.
Sun street	1	1
South terrace	3	3
Taff street	1	1	2	4
Tin street	1	1	2
Tyndall street	1	...	...	1	6	7	15
Thomas street	2	2
Victoria street	1	...	1
Windsor road	5	5
West Dock	6	6
Zinc street	2	2
Total	1	1	16	1	7	23	63	287	399

RIVERSIDE WARD.

NAME OF STREET.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhoea.	Phthisis.	Respiratory Diseases.	Other Causes.	Total.
Ann street	1	...	1	...	...	2	4
Beauchamp street	3	3
Brook street	1	...	...	2	3
Blackstone street	4	4
Berthwin street	1	1
Brunel street	2	2
Clare gardens	1	...	1	...	...	...	2
Cowbridge road	1	...	1	5	7
Craddock street	1	1	...	...	...	...	1	10	13
Clare road	1	...	1
Cathedral road	2	3	4	7	16
Despencer gardens	2	2
De Burgh street	1	...	2	3
Dogo street	1	...	...	...	...	...	...	1
East street	4	4
Eldon road	3	7	10
Fitzhammon Embankment	1	1
Gloucester street	2	2
Green street	1	...	1
Halket street	1	2	2	5
Heath street	1	...	...	...	1
Hamilton street	2	3	5
King's road	5	2	11	18
Lewis street	2	3	5
Mandeville place	1	1
Mansfield street	1	...	...	...	...	1	2
Mark street	1	2	3
Mortimer road	1	...	...	...	...	...	...	...	1	2
Machen place	2	2
North Morgan street	1	...	1
Neville street	1	3	4
Plantagenet street	2	...	...	...	...	1	3
Pontanna avenue and terrace	1	2	3
Pieton place	1	...	...	1
Pitman street	1	...	1
Plasturton avenue and place	1	...	4	5
Plasturton gardens	1	...	1
Rennie street	1	...	...	...	...	...	...	...	2	3
Ryder street	2	2	4
Rawden place	1	2	3
Smeaton street	1	1
Severn road	1	...	...	3	4
South Morgan street	1	1	...	2	4
Stephenson street	1	1	2
Talbot street	2	2
Telford street	2	2
Tudor road	1	6	7
Trevethick street	3	3
Union Workhouse	3	3	2	43	33	142	226
Wellington street	1	...	...	...	...	6	7
Wells street	1	...	2	...	...	...	3
William street	1	...	...	1	2
Wyndham crescent	3	6	9
Wyndham road	2	4	6
Wyndham place	1	...	1	1	3
Wyndham street	1	...	1	6	8
Westbourne crescent	1	1
Total	2	1	2	10	3	16	56	70	286	443

CANTON WARD.

NAME OF STREET.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhea.	Phtisis.	Respiratory Diseases.	Other Causes.	Total.
Atlas road and place	4	4
Anglesey street	1	...	...	...	...	1	2
Alexandra road	1	...	...	2	1	3	3	10
Albert street	3	2	5
Allwood road	1	1
Brecon street	2	...	...	...	...	2	2	6
Cardmarthen street	1	1
Clive road	1	...	2	...	...	1	2	3	4	13
Chancery lane	1	1	3	5
Cowbridge road	4	...	...	1	...	6	8	19
Cardigan street	1	...	...	...	...	1	1	3
Conybeare road	1	1
Conway road	1	...	...	...	...	...	4	5
Denton road	1	...	2	...	...	1	1	...	...	5
Davies place	1	1
Daisy street	1	...	...	...	...	...	...	1	2	4
Delta street	1	...	...	...	1
Earle place	1	1
Eldon road	1	...	1	2	4
Ethel street	2	...	5	3	10
Egerton street	1	...	...	...	...	1	2	4
Forrest road	1	...	...	...	...	1	2	4
Evans terrace	1	...	...	...	1	1	3
Glynne street	1	...	...	...	2	1	4
Glamorgan street	2	...	2	4	8
Harvey street	1	...	...	...	...	1	1	...	2	5
Gladstone crescent	1	1	1	2
Grosvenor road	1	...	...	...	1
Gray street	1	2	...	1	...	7	2	13
Leckwith road	1	...	...	...	2	5	8
Lyndhurst street	1	2	3
Lyttleton street	1	...	1	1	3
Llandaff road	1	2	...	8	11
Loftus street	1	...	...	...	...	...	...	2	2	5
Lionel road	1	...	...	1	...	...	...	2
Lincoln street	2	1	3
Mortimer road	1	...	1	...	...	2	4
Maufair road	1	1
Nottingham street	1	...	1	...	...	1	1	3
Market road	1	...	1	2
Nesta road	1	...	...	1
Picton place	2	2
Ponteanna place	1	...	...	4	5
Penypeel road	3	...	...	1	1	1	4	10
Pembroke road	1	...	1	...	...	1	...	1	4	8
Rolls street	1	1
Railway terrace	1	1	...	2
Rectory road	3	...	...	...	...	...	2	5
Radnor road	2	...	...	1	...	...	1	4
Romilly road and crescent	1	...	6	7
Savern road	2	...	...	1	1	1	4	9
St. John's crescent	1	...	2	3
Slag terrace	1	...	3	4
Springfield place	2	...	2	1	...	5	10
Thornhill street	1	1
Tintern street	1	...	...	1	2
Turner road	1	...	...	...	...	1	2
Turberville place	1	1	2
Wells street	1	3	4
Wellington street	1	...	...	...	...	1	...	2
Westbury terrace	1	1
Total	6	...	30	10	...	26	17	58	128	275

ROATH WARD.

NAME OF STREET.	Small-pox.	Measles.	Scarlat Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhoea.	Phthisis.	Respiratory Diseases.	Other Causes.	Total.
Agate street	1	1
Bradley street	1	2	3
Bertram street	1	...	...	...	3	7	11
Blanche street	2	2
Brickpond	1	1
Beresford road	1	...	1	1	3
Brickworks	1	1
Broadway	1	...	...	...	1	11	13
Booker street	1	...	1
Crofts street	2	2
Cecil street	1	...	...	1	...	2	2	6
Clifton street	1	2	3
Cottrell road	2	1	2	5
Claude road	1	1	2	4
Diamond street	3	5	8
Emerald street	4	6	10
Elm street	1	4	5
Fort street	1	1
Grouse street	1	...	...	...	1
Harold street	1	3	4	8
Helen street	1	...	4	3	8
Nora street	1	...	4	8	13
Newport road	2	7	9
Oakfield street	5	5
Penylan cottage	1	...	1
Partridge road	3	...	2	5
Pearl street and place	3	...	1	...	6	16	26
Ruby street	2	2	4
Richards terrace	1	...	7	8
Roath Court lodge	1	...	...	...	...	...	1
Stacey road	2	2
Sapphire street	1	1
Theodora street	1	4	5
Topaz street	4	2	6
Spring Gardens place	3	...	1	4	8
Total	1	6	...	9	8	48	119	191

GRANGETOWN WARD.

NAME OF STREET.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhoea.	Phthisis.	Respiratory Diseases.	Other Causes.	Total.
Andrews' terrace	1	3	4
Allerton street	1	2	...	3
Amberst street	1	1	...	...	...	...	6	8
Bromfield street	1	1
Bradford street	1	...	1
Bishop street	1	...	1	...	2
Bromsgrove street	1	1	...	4	6
Brick works	1	1
Corporation road	1	1
Clive street	1	...	...	3	3	16	23
Clarence road	1	1
Compton street	1	3	4
Cornwall street and road	1	...	...	...	3	4	8
Clare road	1	...	...	3	3	10	17
Cymmer street	1	...	1
Court road	1	...	...	...	...	1	...	1	4	7
Chester street	2	...	...	...	...	2	4
Cambridge street	1	...	1	...	1	6	9
Dorset street and place	...	1	...	1	1	...	...	...	...	3	6
Devon street and place	2	2	4
Durham street	1	...	...	...	...	...	...	...	6	7
Earl street	2	4	6
Ely harbour	1	1
Forrest street	1	1
Ferndale street	2	...	1	...	...	1	4
Gas works	1	1
Holmesdale street	1	3	4
Hewell street	1	...	10	11
Hereford street	1	...	...	...	...	...	...	...	4	5
Kent street	1	...	1	3	5
Knole street	1	...	...	...	...	4	5
Llanmues street	1	...	...	...	...	2	3
Ludlow street	2	1	3
Lucknow street	1	1	2	3	7
Monmouth street	1	...	...	1
Madras street	1	...	...	...	...	...	2	2	2	7
Machen street	1	...	...	...	1
Llanbraddach street	1	2	3
Newport street	1	2	3
North Clive street	1	4	5
Oakley street	1	1	2
Penhevad street	2	...	...	...	...	4	6
Penarth road	1	4	3	16	24
Pentrebane street	1	...	1	2
Paget street	1	...	...	...	...	...	1	2	7	11
Rudry street	2	2	4
Rutland street	1	...	...	...	1	1	3
Redlaver street	1	...	...	...	2	3	6
Rookwood street	1	...	...	...	...	...	...	...	1	2
Sevenoaks street	1	...	...	...	1	2
St. Fagans street	2	2
Somerset street	1	...	1	...	...	3	...	...	1	6
Stoughton street	1	...	...	1	1	...	...	3	2	8
Saltmead road	1	...	...	...	...	3	3	7
Stockland street	1	...	...	1	...	...	2	4	3	11
Sanatorium ...	3	...	22	1	1	3	...	...	1	...	31
Tynant street	2	1	3
Thomas street	2	1	2	1	6
Virgil street	1	...	...	...	...	...	...	...	1	2
Van street	1	1	2
Warwick street	3	...	...	...	...	...	1	...	4	8
Wedmore road	1	...	2	...	3
York place	1	...	...	...	1	1	3
River Taff	2	2
Total ...	3	14	22	5	20	5	15	23	63	180	350

SPLOTT WARD.

NAME OF STREET.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhea.	Phthisis.	Respiratory Diseases.	Other causes.	Total.
Aberdovey street	1	1
Adeline street	8	...	...	...	4	5	12
Aberystwith street	3	3
Burnaby street	2	2
Bridgend street	1	2	3
Cameron street	1	...	...	...	...	1	2
Coveny street	1	3	4
Caerphilly street	1	2	3
Cornelia street	1	1
Carlisle street	1	...	...	1	...	...	1	2	12	17
Dowlais Works	2	2
Dowlais Works pond	1	1
Eyre street	2	2	4
Enid street	4	4
Elaine street	2	2
Fishguard street	1	...	2	3
Habershon street	1	1	18	15
Howard street and place	1	...	...	...	...	2	1	4
Hinton street	3	3
Janet street	1	1	9	11
Layard street	3	3
Llanelly street	1	...	...	...	2	5	8
Moorland road	2	2	4
Marion street	2	...	...	...	2	6	10
Milford street	1	1	...	...	1	5	8
Menelaus street	1	1
Ordell street	1	...	...	1	6	10	18
Portmann Moor road	1	1	1	5	10	18
Pontypridd street	1	...	...	...	...	6	7
Railway street	1	...	...	...	...	7	11	19
Swinton street	1	1	...	2
Sanquahar street	1	...	1
Seymour street	1	1
Sploft road	1	...	...	...	2	2	7	12
Singleton road	2	...	2
Swansea street and terrace	2	2
Tenby street	1	1	2
Walker road	1	6	7
Wimborne street	1	3	4
Total	1	...	3	11	2	1	9	49	150	226

BOROUGH HOSPITALS.—The present Hospital accommodation for persons suffering from infectious diseases is as follows:—

(a) The New Sanatorium containing 60 beds.

(b) The Small-pox Hospital „ 50 „

The New Sanatorium was opened for the reception of patients in August, 1895, by His Worship the Mayor of Cardiff, Alderman P. W. Carey, J.P., who entertained on the occasion a large number of the principal inhabitants to whom an opportunity was given of visiting the Wards and the Administrative Departments. The Sanatorium comprises two pavilions, each containing two large wards, one for the reception of males the other for females suffering from the same infectious disease. Adjoining each large ward is a small single bed ward for special or private cases.

In addition there has been provided an “Isolation Block” containing six beds and intended for the reception of cases about the nature of which there may be some doubt, or for such as develop some other infectious disease concurrently with that for which they were admitted.

Up to the present, the large wards and the single bed wards adjoining have been used entirely for cases of Scarlet Fever. The beds of the Isolation Block for cases of Typhoid Fever and Diphtheria.

The Small-pox Hospital (which was at first temporarily used for Scarlet Fever) is situated on land adjoining the grounds of the Sanatorium but completely separated from it.

It is administered separately and has a separate staff, laundry, ambulance, and approach, and contains altogether in three wards accommodation for about 50 persons. It is strictly speaking a temporary building made of galvanised iron, wood, and felt, etc., and as regards structure and nature of accommodation one of the best of its kind. The Hospital Committee have resolved to acquire the land between the Hospital and the railway embankment for the purpose of improving the boundaries. This has become an absolute necessity now that these wards are used for Small-pox. It is recognised on all sides, whatever views one may have as to the aerial transmission of Small-pox, that the area on which a Small-pox Hospital stands should be greater in extent than that of a Hospital of similar size intended for the ordinary infectious diseases, and that communication with the surrounding neighbourhood should be cut off as far as possible.

Indeed, the Local Government Board have in a recent memorandum advised that a Local Authority should not contemplate the erection of a Small-pox Hospital on any site where it would have within half-a-mile of it, as a centre of population 500 to 600 persons, whether in one or more institutions or in dwelling-houses. Hence the extreme and urgent necessity of acquiring more land in the neighbourhood of this Hospital.

Your Authority has very wisely determined that the ordinary wards of the Hospital shall be available without charge for suitable cases of infectious disease occurring in the families of residents in the district. A fixed charge, however, is made for those who desire special accommodation and also in the case of patients sent to the Hospital by the Guardians of the Cardiff Union. The opinion of health officers is unanimously in favour of permitting free hospital isolation, and the same view has been frequently expressed by the Local Government Board. Hospitals for infectious diseases are established in order to protect the public health; each case of fever retained in a house in which complete isolation is impossible is a danger to the community at large. It has been found over and over again in those districts where a charge is made to all using the hospital that little advantage is taken of the accommodation provided, and that those cases which it is most desirable to isolate remain at home in dwellings which are totally unsuitable for the treatment of such cases. Moreover, the retention at home of children suffering from such a disease as Scarlet Fever means usually in each case the interruption of the education of the remainder of the family for a period of at least six or eight weeks, and very often also it means the interference with the occupation of the bread-winner or the loss of business in the case of a tradesman.

The following tables show the number of cases under treatment at the Hospitals during the year and the results in each case, also the expenditure during the same period.

Dr. B. W. Broad, who was appointed Resident Medical Officer at the Hospital in January, 1896, continues to act in that capacity, and Miss Hay, who was appointed Matron in August of the same year remains also in the same position. I have to acknowledge the excellent services which have been rendered to the Institution by both these Officials.

TABLE XXXII.—Showing the number of Patients under treatment at the Borough Hospitals for Infectious Diseases during 1896.

		MALES.		FEMALES.		TOTAL.
		Under 5 Years.	Over 5 Years.	Under 5 Years.	Over 5 Years.	
I.—Remaining in hospital on 31st December, 1895 :—						
Scarlet Fever	...	6	6	6	17	35
Typhoid Fever	...	...	2	...	1	3
Diphtheria	...	...	...	...	...	...
Small-pox	...	...	1	...	...	1
Total	...	6	9	6	18	39
II.—Admitted during the year ending 31st December, 1896 :—						
Scarlet Fever	...	65	127	66	162	420
Typhoid Fever	...	...	11	...	10	21
Typhus Fever	...	...	...	...	1	1
Diphtheria	...	2	3	1	4	10
Small-pox	...	...	39	...	9	48
Total	...	67	180	67	186	500
Total under treatment in 1896	...	73	189	73	204	539
III.—Of the above there were Discharged						
(a) Recovered :—						
Scarlet Fever	...	55	106	54	144	359
Typhoid Fever	...	...	12	...	8	20
Typhus Fever	...	...	...	...	1	1
Diphtheria	...	2	1	...	4	7
Small-pox	...	...	37	...	8	45
Total	...	57	156	54	165	432
IV.—(b) Died :—						
Scarlet Fever	...	7	3	8	6	24
Typhoid Fever	...	...	1	...	2	3
Diphtheria	...	...	...	1	...	1
Small-pox	...	...	2	...	1	3
Total	...	7	6	9	9	31
V.—Remaining in hospital on 31st December, 1896 :—						
Scarlet Fever	...	9	24	10	29	72
Typhoid Fever	...	...	...	...	1	1
Diphtheria	...	...	2	...	...	2
Small-pox	...	...	1	...	...	1
Total	...	9	27	10	30	76
Total under treatment in 1896	...	73	189	72	205	539

The proportion of deaths to cases under treatment during the year was as follows:—

Disease.				Mortality per cent.
Scarlet Fever	...	...	...	5.2
Typhoid Fever	...	...	...	10.7
Diphtheria	...	...	...	10.0
Small-pox...	...	...	...	6.5

HOSPITAL EXPENDITURE FOR THE YEAR 1896.

	£	s.	d.
Provisions, Stores, and Drugs	1,650	4	5
Gas	82	0	0
Water and other rates...	75	0	0
Petty Expenses	24	0	0
Keep of one horse	29	18	0
Coal and Firewood	220	2	5
Salaries and Wages	698	15	0
	2,779	19	10
Deduct for receipts from Patients	150	0	0
Deduct $\frac{1}{2}$ of Coal Account for town disinfection	50	0	0
Total	2,579	19	10

Dividing this amount by the number of patients under treatment, the average cost per head during the year was £4 4s., and the average cost per week per patient 12s. 6d. These figures compare very favourably with those of other Institutions of the same kind.

TABLE XXXIII.—Death-rate per 1,000 from classes of disease, 1885-96.

YEARS.	Class IV. Constitutional Diseases.		Class V. Development Diseases.		Class VI. Local Diseases.	
	Cardiff.	England and Wales.	Cardiff.	England and Wales.	Cardiff.	England and Wales.
1885	4.122	3.340	3.091	1.614	10.924	10.007
1886	4.305	3.370	3.563	1.638	10.373	10.040
1887	3.203	3.213	3.442	1.578	10.384	9.867
1888	3.306	3.166	2.947	1.569	9.275	9.643
1889	3.690	3.223	1.446	1.550	9.164	9.394
1890	3.498	3.374	1.692	1.611	10.101	10.364
1891	3.645	3.339	1.366	1.690	11.398	10.807
1892	3.517	3.168	1.240	1.624	7.791	9.801
1893	3.470	3.210	1.257	1.593	8.261	9.536
1894	3.143	3.015	1.208	1.462	7.280	8.427
1895	3.148	3.169	1.253	1.678	8.423	9.433
1896	2.624		1.180		8.439	

SANITARY CONDITION OF THE DISTRICT, AND SUMMARY OF WORK PERFORMED BY THE OFFICERS OF THE HEALTH DEPARTMENT.

The systematic house to house inspection of the district, commenced in January, 1891, was continued throughout the year. The following tables show the result of this inspection during the year, from which it will be seen that a large number of sanitary defects have been remedied. The erection of new houses, together with the construction of their drainage, is entirely under the control of the Borough Engineer and Surveyor, and of the Officers of his Department.

HOUSE INSPECTION.—CENTRAL WARD.

NAME OF STREET.	No. of Houses Inspected.	Defective Drains.	Choked Drains.	W.C. Pans and Syphons Defective.	Defective Stench Traps permitting an escape of Sewer Gas.	Sewery Sinks connected direct with Drain.	Inside Closets not ventilated.	Closets not supplied with water.	Other Nuisances.
Ruperra street ...	15	...	...	1	9	...	...	15	4
David street ...	31	...	...	3	9	..	...	31	10
Giles court...	4	...	1	2	...	...	...	4	...
Mary Ann street ...	8	...	...	...	...	...	...	8	8
Homfray street ...	23	...	...	1	4	...	...	16	11
Tredegar street ...	47	3	...	8	9	...	...	47	14
East terrace ...	22	7	...	8	1	...	...	22	6
Gulliver's court ...	2	...	...	...	1	...	...	2	...
Millicent street ...	28	1	...	...	4	...	...	...	5
Evans court ...	2	...	...	...	...	...	...	2	3
Little Bridge street ...	4	...	...	...	...	...	...	3	2

CATHAYS WARD.

NAME OF STREET.	No. of Houses Inspected.	Defective Drains.	Choked Drains.	W.C. Pans and Syphons Defective.	Defective Stench Traps permitting an escape of Sewer Gas.	Sewery Sinks connected direct with Drain.	Inside Closets not ventilated.	Closets not supplied with water.	Other Nuisances.
Thesiger street ...	20	...	...	...	...	...	...	20	3
Norman street ...	16	2	...	...	...	...	...	16	5
Minister street ...	21	6	...	1	4	...	...	21	8
Merthyr street ...	44	11	...	...	...	...	...	44	18
Treorkey street ...	28	7	...	...	...	...	...	28	12
Treherbert street ...	45	5	2	...	...	...	...	45	8
Hirwain street ...	52	9	1	...	...	...	...	52	25
Cairns street ...	14	...	1	...	...	...	...	14	4

PARK WARD.

NAME OF STREET.	No. of Houses Inspected.	Defective Drains.	Choked Drains.	W.C. Pans and Syphons Defective.	Defective Stench Traps permitting an escape of Sewer Gas.	Sewery Sinks connected direct with Drain.	Inside Closets not ventilated.	Closets not supplied with water.	Other Nuisances.
Shakespeare street ...	87	37	...	2	34	...	...	87	15
Byron street ...	48	25	1	...	21	...	...	48	22
Clive place ...	18	4	...	2	...	...	...	18	1
Russell street ...	48	6	...	2	4	...	...	48	11
Moy road ...	45	...	...	...	...	...	...	45	...
Castle road ...	15	...	...	...	...	...	...	15	16
Crofts street ...	27	7	...	...	5	...	...	27	9

ADAMSDOWN WARD.

NAME OF STREET.	No. of Houses Inspected.	Defective Drains.	Choked Drains.	W.C. Pans and Syphons Defective.	Defective Stench Traps permitting an escape of Sewer Gas.	Sewery Sinks connected direct with Drain.	Inside Closets not ventilated.	Closets not supplied with water.	Other Nuisances.
Angusta street ...	58	5	...	11	2	...	...	58	31
Moirs place ...	31	4	1	3	...	...	...	30	8
Moirs street ...	32	5	...	1	...	...	...	32	9
North Luton place ...	24	3	...	2	...	...	...	23	20

RIVERSIDE WARD.

NAME OF STREET.	No. of Houses Inspected.	Defective Drains.	Choked Drains.	W.C. Pans and Syphons Defective.	Defective Stench Traps permitting an escape of Sewer Gas.	Sewery Sinks connected direct with Drain.	Inside Closets not ventilated.	Closets not supplied with water.	Other Nuisances.
Hamilton street ...	87	12	...	5	...	...	...	52	7
Halket street ...	50	...	...	...	...	...	...	48	2

CANTON WARD.

NAME OF STREET.			No. of Houses Inspected.	Defective Drains.	Choked Drains.	W.C. Pans and Syphons Defective.	Defective Stench Traps permitting an escape of Sewer Gas.	Sewery Sinks connected direct with Drain.	Inside Closets not ventilated.	Closets not supplied with water.	Other Nuisances.
Springfield place	...	...	25	10	8	1	8	...	...	25	20
Gray street	...	...	56	...	...	...	...	...	...	45	4
Ethel street	...	...	85	23	6	10	20	...	...	85	36
Pen-y-peel road	...	...	67	10	2	8	8	...	...	67	4

ROATH WARD.

NAME OF STREET.			No. of Houses Inspected.	Defective Drains.	Choked Drains.	W.C. Pans and Syphons Defective.	Defective Stench Traps permitting an escape of Sewer Gas.	Sewery Sinks connected direct with Drain.	Inside Closets not ventilated.	Closets not supplied with water.	Other Nuisances.
Diamond street	...	...	69	14	...	8	20	...	...	69	34
Nora street...	...	...	71	2	1	...	...	...	...	71	7
Topaz street	...	...	61	8	1	2	32	4	...	61	25
Stacey road	...	...	127	...	2	11	35	...	...	83	33
Crofts street	...	...	22	12	1	...	4	...	...	21	9
Ruby street	...	...	59	...	...	1	...	...	...	59	16

GRANGETOWN WARD.

NAME OF STREET.			No. of Houses Inspected.	Defective Drains.	Choked Drains.	W.C. Pans and Syphons Defective.	Defective Stench Traps permitting an escape of Sewer Gas.	Sewery Sinks connected direct with Drain.	Inside Closets not ventilated.	Closets not supplied with water.	Other Nuisances.
Compton street	...	...	57	...	5	...	...	...	...	57	19
Hewell street	...	...	78	22	12	2	21	...	...	78	26
Oakley street	...	...	78	10	5	1	88	...	...	78	27
Virgil street	...	...	11	...	...	...	...	...	...	11	...
Knole street	...	...	54	6	...	7	40	...	...	54	25
Bromsgrove street	...	...	27	5	...	...	15	...	...	27	2
Sevenoak street	...	...	38	10	...	...	...	...	...	38	10
Forrest street	...	...	10	8	...	...	...	...	...	10	4
Holmesdale street	...	...	106	9	1	25	29	...	...	106	42

SPLOTT WARD.

NAME OF STREET.	No. of Houses Inspected.	Defective Drains.	Choked Drains.	W.C. Pans and Syphons Defective.	Defective Stench Traps permitting an escape of Sewer Gas.	Sanitary Sinks connected direct with Drain.	Inside Closets not ventilated.	Closets not supplied with water.	Other Nuisances.
Fishguard street ...	58	1	...	...	...	...	...	58	20
Pontypridd street ...	68	8	1	2	...	1	...	66	30

INSPECTION OF FACTORIES AND WORKSHOPS.

UNDER THE FACTORY AND WORKSHOP ACTS, 1878-95, AND THE SHOP HOURS ACT, 1892.

During the year a large number of workshops have been inspected. The results of these inspections are given in the annexed tables.

INSPECTION OF WORKSHOPS.

Nature of Workshops.	No. on Register.	Number of Inspections.
Tailors ...	89	272
Dressmakers ...	129	292
Bootmakers ...	41	103
Bakers ...	126	322
Tin Smiths ...	2	3
Milliners ...	31	131
Flour Packers ...	1	1
Coachbuilders ...	7	12
Plumbers ...	11	19
Carpenters and Joiners ...	5	5
Blacksmiths ...	10	31
Upholsterers ...	16	28
Paper Bag Makers ...	3	17
Watchmakers ...	2	4
Cigarette Makers ...	1	3
Curriers ...	1	4
Laundries ...	7	47
Sugar Boilers ...	4	10
Chairmakers ...	1	18
Printers ...	2	45
Oatmeal Packers ...	1	5
Cycle Works ...	1	4
Waterproof Manufacturers ...	2	5
Saw Mills ...	...	5
Bottling Stores ...	2	33
Box Makers ...	1	5
Oilskin Manufacturers ...	2	3
Marble Works ...	...	3
Chemical Works ...	...	7
Cap Makers ...	1	1
Hose Manufacturers ...	1	2
File Works ...	1	1
Jam Works ...	...	2
Boat Builders ...	...	4
Waggon Works ...	...	6
Total ...		<u>1,451</u>

Notices of New Workshops from Inspector of Factories under Factory Act, 1891, Sec. 26, Sub. 2, Factory Act, 1895, Sec. 41 = 21.

Notices from Inspector of Factories *re* Sanitary Defects in Workshops, 30, Sec. 4, Factory and Workshop Act, 1878.

Notices sent by Sanitary Authority to Inspector of Factories under Sec. 3, Factory and Workshop Act, 1891 = 20.

WORKSHOPS.

Nuisance Abated.	Oilskin Manufacturers.	Carpenters.	Chairmakers.	Marble Works.	Wagon Works.	Capmakers.	Aerated Water Works or Bottling Stores.	Coachbuilders.	Saw Mills.	Cycle Works.	Printers.	Blacksmiths.	Upholsterers.	Bootmakers.	Lanndries.	Curriers.	Dressmakers.	Bakers.	Tailors.	Milliners.
Water closets cleansed and repaired	2	1	3	2	...	...	2	2	...	5	2	...
Water closets supplied with water	1	...	...	1	...	...	1	...	1	...	4	...	...	...	2	...
Drains trapped and repaired	1	...	...	...	...	...	...	1	...	...	...	2	...	...	1	...	...
Ventilation provided	1	...	...	...	...	...	1	1	...
Limewashed	1	...	...	1	...	1	...	...	...	...	1	2	1	1	4	21	12	...
Repaired ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Overcrowded	4	...	4	1
Closed
W.C. accommodation provided	2	...	...	...	2	...	...	...	...	...	1	...	1	...
Abolished	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	1	1	1	1	1	1	1	2	2	1	7	8	2	2	9	1	9	28	22	1

SHOP HOURS' ACT, 1892.

NATURE OF SHOPS INSPECTED.	Number of Inspections.	Number of Shops in which young persons are employed.	Infringement of Act.	Proceedings taken. Result.
Carvers and Gilders ...	16	12	...	...
Tea Merchants ...	10	7	...	...
Mantle Shops ...	12	12	...	...
Tobacconists ...	68	56	...	...
Confectioners ...	80	25	...	...
Stationers ...	30	29	...	...
Furnishers ...	27	20	...	...
Clothiers... ..	60	53	...	...
Drapers ...	185	157	1	10/- and Costs.
Hairdressers ...	79	67	...	...
Hatters and Hosiers ...	29	28	...	...
Grocers ...	381	366	...	...
Restaurants ...	58	47	...	...
Boot and Shoe Shops ...	98	54	...	...
Fishmongers ...	30	24	...	...
Fruiters ...	56	42	...	...
Chemists... ..	78	61	...	...
Ironmongers ...	106	93	...	...
Butchers... ..	140	116	...	...
Pawnbrokers ...	47	38	...	...
Fancy Toy Shop ...	35	20	...	...
Total	1,575	1,365	1	1

INSPECTION OF COMMON LODGING HOUSES.—These houses are regulated by the provisions of the Public Health Act, 1875. Section 77 requires all Common Lodging Houses to be registered, and Section 80 empowers the Sanitary Authority to make Bye-laws.

- (1) For fixing and from time to time varying the number of lodgers who may be received into a Common Lodging House, and for the separation of the sexes therein.
- (2) For promoting cleanliness and ventilation in such houses.
- (3) For the giving of notices and the taking precautions in the case of any infectious diseases ; and
- (4) Generally for the well ordering of such houses.

In the year 1891, your Authority adopted Bye-laws which correspond closely with the "Model Bye-laws" of the Local Government Board.

The following table gives the results of the inspection of these houses during the year :—

COMMON LODGING HOUSES.

Total number on register	...	...	...	...	100
Registered rooms	...	...	...	...	415
Number of persons certified to accommodate	...	...	...	...	1,607
Day inspections ...	...	...	...	...	2,490
Night " ...	...	...	...	...	457
W.C.'s cleansed and repaired	...	...	...	...	205
" supplied with water	...	...	...	...	32
Additional W.C. accommodation provided	...	...	...	...	2
Drains trapped and repaired	...	...	...	...	50
Soil pipes ventilated	...	...	...	...	0
Special ventilation provided to rooms	...	...	...	...	20
Limewashed	...	...	...	...	198
Repaired	...	...	...	...	116
Overcrowded	...	...	...	...	2
Yards paved	...	...	...	...	6
Accumulations removed	...	...	...	...	28
Infectious disease discovered...	...	...	...	...	10
Registered during the year	...	...	...	...	7

SLAUGHTER HOUSES AND MEAT INSPECTION.—During the year the Public Abattoirs at Roath and Canton have been regularly inspected, 191 visits were paid to these places, and 241 to the meat markets.

No private slaughter-houses exist in the Borough, and no cases of illegally slaughtering in unlicensed premises came to the knowledge of the Sanitary Authority.

The Managers of the Abattoirs report to me that during the year the following animals were slaughtered :—

			Roath Abattoir.	Canton Abattoir.
Beasts slaughtered	...	...	6,573	772
Sheep	"	...	45,151	7,789
Calves	"	...	3,628	845
Pigs	"	...	20,268	5,317
Total	...	...	<u>75,620</u>	<u>14,228</u>

The following is the amount and description of food seized and dealt with under the 116-119 Sections of the Public Health Act :—

Beef	...	...	2,740 lbs.
Pork	...	...	880 "
Veal	...	...	70 "
Mutton	...	...	111 "
Game	...	...	95 "
Total	...	...	<u>3,896 lbs.</u>

The following report was presented to the Health Committee on the subject of Meat Inspection :—

REPORT OF THE MEDICAL OFFICER OF HEALTH ON MEAT INSPECTION.

TO THE HEALTH AND PORT SANITARY COMMITTEE.

GENTLEMEN,—

At your request I beg to submit for your consideration the following report on the system of Meat Inspection adopted in Cardiff.

The report is based on the subjoined communication from the Chamber of Commerce, which was referred to your Committee.

“TO. J. L. WHEATLEY, ESQ.,
Town Clerk, Cardiff.

MEAT INSPECTION.

“Dear Sir,

“I am directed to inform you that this question was taken into the consideration of my Chamber at their last meeting.

“We are informed that very few of the Meat Inspectors have any experience qualifying them for this special duty. My Chamber is of opinion that no one should be appointed a Meat Inspector who is not expert in meat, and, therefore, qualified to properly discharge the duties of the post.

“I am instructed to call your attention to this matter as one of great importance, and would urge the County Council only to employ for this purpose those who have sufficient experience to qualify them for the duties of the post.

“Yours truly,

“W. R. HAWKINS.”

It is generally acknowledged that the chief points to be aimed at in order to secure an efficient inspection of meat, are the erection of public abattoirs and the abolition of private slaughter-houses. Unfortunately no general powers exist enabling Local Authorities to close these private slaughter-houses, and where this has been done it has been effected by a private Act of Parliament, so that in many places these Authorities have built and fitted up convenient and suitable abattoirs and have been unable to compel the butchers to give up slaughtering in their own badly arranged and insanitary premises.

In Cardiff both these desirable conditions have been secured. You have two admirably constructed and well managed public abattoirs, and for many years past not a single private slaughter-house has been in use, their abolition having been effected by a private Act of Parliament.

The inspection of meat and cattle is therefore a comparatively simple matter, the slaughtering being confined to these two centres, which are under the control of Corporation officials.

The system of meat inspection varies in its details in different towns, but the principle upon which the system is worked is the same in all and is governed by the powers contained in the Public Health Act, 1875, which impose upon the Medical Officer of Health primarily, and upon the Inspector of Nuisances secondarily, the duty of examining meat and deciding whether it is unfit for food and should be seized and carried before a Magistrate, who alone has the power of condemning it and of ordering its destruction.

Besides the above-mentioned officers, the Sanitary Authority has in most cases the services of a Veterinary Inspector appointed under the Contagious Diseases (Animals) Act, and who has statutory duties under this Act. This Inspector is, however, in many places engaged by the Health Department to advise as to the condition of diseased animals and meat which may be in the public-slaughter-houses. These duties are outside his work under the above-named Act.

In Cardiff the method adopted is as follows:—The District Inspectors of Nuisances visit the slaughter-houses twice a week regularly, and also at other times on receipt of a message from the Resident Superintendent. Mr. Moir, the Veterinary Inspector, also visits these places twice a week, and in the event of any of these officials discovering any diseased meat or suspecting the quality of any meat exposed for sale, they at once communicate with me and I make an inspection, and, if necessary take steps for preventing its use for food. I have to acknowledge the very great assistance rendered to me in these cases by Mr. Moir. Medical Officers of Health do not, of course, profess to be Veterinary Surgeons, and they are very often less likely to be correct in the diagnosis of the disease than one who is accustomed to see and treat animals suffering from various complaints. This Veterinary Inspection does not, however, relieve the Medical Officer of Health from the responsibility of pronouncing whether the meat in question is fit for food. This is altogether a medical question. The most important point raised by the communication from the Chamber of Commerce, and which requires your consideration, is whether the Meat Inspector's who act under the direction of the Medical Officer of Health, and whose business it is to detect diseased meat, should be men whose education and training have enabled them to possess a practical acquaintance with the diseases of animals; that is, either Veterinary Surgeons or Butchers. With a view of ascertaining the custom in this respect in other large towns, I addressed a series of questions to the Local Health Officers, and by their courtesy I am enabled to give you the information which is appended to this report. From the replies which I have received from 29 towns it would seem that there is only one other besides Cardiff in which all private slaughter-houses have been abolished. We are, therefore, in a peculiarly good position as regards the facilities for meat inspection. The difficulty encountered by Local Authorities in compelling butchers to use public slaughter-houses arises from the fact that no such power exists in the Public Health Act or in any other general Act of Parliament. In each case, therefore, a Local Act is necessary before private slaughter-houses can be permanently closed.

In twelve of the towns from which replies have been received the Meat Inspectors have had previous experience either as practical butchers or in the cattle trade. In some few the work appears to devolve entirely upon the Veterinary Inspector, but in the majority it is carried out as in Cardiff, that is, by the Inspectors of Nuisances and the Veterinary Inspector, who call in the Medical Officer of Health to decide whether the meat is fit for human food.

This system works well, although, as I have previously pointed out in my Annual Reports, it is capable of development and improvement, chiefly, I think, in the direction of a more thorough veterinary inspection.

I have had no experience with respect to butchers acting as meat inspectors, but I doubt the advisability of making such appointments.

It is well known that the inspection of meat in the chief continental cities and towns is carried out in a much more systematic and elaborate manner than in England. It is stated by Dr. Legge, a high authority upon this subject, that "it would be within the truth to say that in this respect Great Britain is at least twenty years behind Germany, France, Belgium, and Denmark. In the first place, in most towns in England private slaughter-houses are the rule and public slaughter-houses the exception, whilst on the Continent the reverse is the case. Taking Berlin as an example, the service of meat inspection at the City Abattoirs, and at different meat stations, comprises forty Veterinary Surgeons and forty-eight men under them who take samples for examination, sixteen meat stampers, and some two hundred men and women charged with microscopical examinations.

It does not appear that the British public is yet sufficiently alive to the importance of the subject, or would consent to the enormous expense of carrying out inspection on the Continental plan, although the conclusions arrived at by the recent Royal Commission appointed to enquire into the effect of food derived from tuberculous animals will probably do something towards arousing public opinion and stimulating authorities to undertake a more scientific control of the food supply. It must not, however, be forgotten that the danger of the spread of cattle plagues and pestilences is greater on the Continent than in England, owing to the contiguity to Russia, which is the chief breeding place of these diseases. The Royal Commission in their report point out that one of the chief dangers to be guarded against is the consumption of meat affected with tuberculosis, a disease extremely prevalent amongst cattle, and which may be transmitted to the human being consuming such meat. The report also deals with the danger of the consumption of milk from tuberculous cows. It is believed that such milk may convey the disease, and the frequency of intestinal tuberculosis amongst young children is adduced as evidence in favour of this view.

The conclusions of the Royal Commission are so important that it may be well for your information to give the following extracts. On page 12 the Commissioners say :—

“ We regard it then as established that any person who takes tuberculous matter into the body as food incurs the risk of acquiring tuberculous disease, and we know that this matter may be found in parts of animals affected by the disease.”

Paragraph 38.—“ This matter is found principally in the organs of the animals, as a rule most abundantly in the lungs and other organs, which are usually removed by the butcher in ‘ dressing ’ the carcase.”

Paragraph 39.—“ In the tissues, which go to form the butcher’s ‘ joint,’ the material of tubercle is not often found, even where the organs exhibit very advanced or generalised tuberculosis; indeed, in muscle and muscle juice it is very seldom that tubercle bacilli are to be met with, perhaps they are somewhat more often to be discovered in bone, or in some small lymphatic glands imbedded in inter-muscular fat. Yet there is always a difficulty in making sure of the absence of tuberculous matter from any part of a carcase that shows evidence of tubercle elsewhere.”

Paragraph 48 :—“ That if sufficient discrimination and care were exercised in taking meat from tuberculous cattle a great deal of meat from them might without danger be consumed by the community. The practice of public abattoirs on the Continent appears to be founded on the same belief.”

Paragraph 49.—“ That the operations of slaughter and dressing should be done under skilled supervision, with the object of securing the removal and destruction of every part of a carcase that contained any tubercle whatever, and also the destruction of the whole carcase in cases where the animal was found to have advanced generalised tuberculosis.”

Paragraph 51.—“ That little evidence about the more serious degrees of tuberculosis in the animal would be discoverable in carcasses from which the organs had been removed, and that this is habitually the case with so-called “ dead meat,” whether English or foreign; still, there are indications in such a carcase, to the eye of an experienced Inspector, of the more dangerous forms of tuberculosis having existed in the animal.”

From this last paragraph it is obvious that where such indications are met with by the experienced Inspector the meat should be considered as unfit for food and should be condemned.

Again, the Commissioners referring to the consumption of milk from tuberculous cows state in

Paragraph 63.—“ The withdrawal from dairies of every cow that had any disease of the udder, would form some approach to security against the serious danger incurred by man from the use of tuberculous milk, but it would not be an adequate security. The presence in a dairy of a tuberculous cow is a decided danger to the public, especially having regard to what we have learnt respecting the rapid development of tuberculosis in the udder, and the degree of danger to milk consumers incurred by the invasion of the udder in tuberculous cows.”

Fortunately we now possess a means of detecting tuberculous disease in animals which seems likely to prove of considerable value. It is found that the inoculation of tuberculin into tuberculous animals gives a reaction which may be relied on as a means of diagnosis. This plan has been adopted with excellent results abroad, especially in Denmark, in which country the inspection of cows in dairies is carried out in an unusually thorough manner, and where a new law provides for the gratuitous supply of tuberculin to farmers, and lays down specific regulations for dealing with cattle in which the disease has been detected by this means.

The question of the inspection of milch cows is therefore intimately connected with the inspection of meat. At present this is performed in this district by an Inspector in the Health Department, whose duty it is to see that the regulations under the ‘ Cowsheds, Dairies and Milkshops ’ Order are strictly carried out, and so far as these regulations permit, these places are kept in a condition as favourable as possible to the health of the animals.

From the returns appended to this report it will be seen that besides the meat slaughtered in the public abattoirs at Roath and Canton, the community is supplied with a large quantity of imported foreign meat. Taking the year 1895, I find that 86,566 animals were slaughtered in the abattoirs, and that the number of carcasses of foreign meat received into the adjoining meat markets was 6,870, two-thirds of this number came from Birkenhead by rail, the remainder from London and Bristol.

In addition to this a large quantity of meat was received direct into the Ice Stores, and was distributed to the various butchers and purveyors of meat, besides about 260 tons of frozen meat delivered to Eastman's shops in the town.

The animals slaughtered at Birkenhead, London and Bristol are inspected at these places before they are sent here, and as an additional safeguard your Inspectors visit systematically the various butcher's shops and provision merchants in the town, and report to me if they discover any meat of suspicious quality.

I may add that all the District Inspectors, although they have had no practical experience in the meat trade, have passed the examination of the Sanitary Institute, in which a knowledge of diseases of animals is required. From the foregoing remarks you will see that owing to the enlightened policy adopted by your Corporation with respect to the abolition of private slaughter houses and the provision of public abattoirs, you have an advantage as regards the facilities for meat inspection as compared with the other towns from which returns have been received, which is shared only by Burnley. It is for your Committee to decide whether you will improve your position by a further development of the system of Veterinary Inspection, bearing in mind that as a Sanitary Authority your first duty in this matter is to protect the public from an unwholesome food, whilst at the same time avoiding such undue interference with an important trade as might diminish unnecessarily the amount of available meat and so raise its price.

Should you decide in favour of a more extended system of inspection it would be necessary to make an arrangement with your Veterinary Inspector for the inspection of all carcasses and meat in your Public Meat Markets, and I would suggest that it should form part of his duty to make a written report on the condition of any meat which he considered diseased, and that these reports should be at once forwarded to the Medical Officer of Health, who would when necessary visit the market and decide as to what steps should be taken. It would also be the duty of the Veterinary Inspector to inspect all cows in registered cow-sheds, and examine them more particularly in respect to their reaction with tuberculin, referring each case to the Medical Officer of Health to decide whether milk should be supplied from such animals, and to give instructions as to the steps which should be taken with the view of preventing the distribution of infected milk. I believe that an inspection carried out on the lines indicated in this report might be adopted without any great additional expense, and with advantage to the public. The following Tables give particulars relating to meat inspection in various towns.

(For Returns see Three following pages).

NUMBER OF ANIMALS SLAUGHTERED AT THE ROATH AND CANTON ABATTOIRS IN 1895.

ABATTOIRS.	BEASTS.	SHEEP.	CALVES.	PIGS.	TOTALS.
ROATH	7,287	39,035	3,700	25,065	75,087
CANTON	822	6,536	475	3,646	11,479
TOTAL	8,109	45,571	4,175	28,711	86,566

NUMBER OF CARCASSES OF FOREIGN MEAT RECEIVED INTO THE ROATH AND CANTON MEAT MARKETS IN 1895.

BEASTS.	SHEEP.	CALVES.	TOTAL.
2,688	4,004	178	6,870

FOREIGN MEAT RECEIVED INTO THE ICE STORES IN 1895.

QUARTERS OF BEEF.	SHEEP AND LAMBS.	CALVES.	PIECES OF MUTTON.	PIGS.	TOTAL.
10,844	118,458	179	49,238	178	178,897

I am, &c.,

E. WALFORD, M.D.,

Medical Officer of Health.

The Health Committee having given the above Report their consideration recommended the appointment of Mr. C. Moir, Veterinary Surgeon, as Meat Inspector to the Health Department. This recommendation was subsequently adopted by the Council, and the appointment of the Inspector was confirmed.

MEAT INSPECTION.—Returns from 29 Towns.

City or Borough.	Population.	No. of Private Slaughter Houses.	No. of Public Abattoirs.	No. of Meat Inspectors.	Salaries of Inspectors.	Qualification of Inspectors.	REMARKS.
NEWCASTLE-UPON-TYNE	212,223	133	0	2	1.—£225 per annum. 2.—£104	No special qualification	...
LEEDS	402,449	129	1	2	£125 each	Both previously in Cattle trade	...
MANCHESTER	531,697	115	2	4	1.—£900 2.—£150	All trained Inspectors	...
SALFORD	210,707	81	0	1	£262	Veterinary Surgeon	...
NORWICH	107,000	41	0	0	...	...	Inspection of Meat is carried out by Inspector of Nuisances and by Veterinary Inspector paid by fee.
GATESHEAD	98,436	85	0	0	...	...	Inspection carried out as in Norwich.
BURNLEY	100,000	0	1	1	£100	Retired Butcher	...
BIRMINGHAM	501,241	230	1	2	1.—£182 2.—£156	1.—15 years' experience 2.—Butcher	...
WEST HAM	261,297	32	0	0	...	...	Inspection done by Inspectors of Nuisances who hold certificate of Sanitary Institute.
PLYMOUTH	90,276	8	2	1	£150	Butcher	Has charge of Meat Markets and Slaughter Houses.

MEAT INSPECTION.—Returns from 29 Towns (*continued*).

City or Borough.	Population.	No. of Private Slaughter Houses.	No. of Private Abattoirs.	No. of Meat Inspectors.	Salaries of Inspectors.	Qualification of Inspectors.	REMARKS.
BOLTON ...	120,280	26	16	2	1.—£150 1.—£20 £200	Butchers ...	Inspector has thorough knowledge of diseases of animals. Work done by Inspector of Nuisances.
HULL ...	220,844	81	0	1	...	Butcher ...	
SUNDERLAND	140,386	12	0	0	...	...
DERBY ..	101,770	63	0	0	...	...
LEICESTER	198,659	90	1	1	£120	Retired Butcher ...	Work done by Inspector of Nuisances and by Veterinary Inspector who is paid by fee 110/6). An average of 240,000 beasts slaughtered per annum, exclusive of sheep, pigs and calves.
OLDHAM ...	143,442	57	0	0	...	...
BIRKENHEAD	110,000	2	2	1	£200	Retired Butcher ...	
HALIFAX ...	95,000	9	1	1	£150	Special Training ...	
LIVERPOOL	641,063	24	1	5	1.—£230 2.—£140 1.—£130 1.—£120	Butchers with Special Training	Work done by Inspector of Nuisances who have certificate of Sanitary Institute.
SHEFFIELD	347,278	190	0	1	£135	Experience in meat trade	
WOLVERHAMPTON ...	82,662	71	1	0	...	...

MEAT INSPECTION.—Returns from 29 Towns (*continued*).

CITY OR BOROUGH.	Population.	No. of Private Slaughter Houses.	No. of Public Abattoirs.	No. of Meat Inspectors.	Salaries of Inspectors.	Qualification of Inspectors.	REMARKS.
BLACKBURN	129,000	20	24	1	1.—£180	Retired Butcher	...
BOYDON	118,000	25	1	0	...	...	...
HUDDESFIELD	100,000	20	1	0	...	...	...
PORTSMOUTH	178,639	191	0	1	1.—£165	Butcher	...
BRIGHTON	120,499	42	1	2	1.—£117 1.—£78	1.—Great Experience	...
PRESTON	113,864	107	1	1	£180	Retired Butcher	...
SWANSEA	98,250	2	1	1	£15	...	...
BRISTOL	230,623	85	2	1	£78	Experienced Butcher	...

Work done by Inspectors of Nuisances.

Chief Inspector is also Superintendent of Abattoirs.

Abattoir belong to Docks Company.

SEWER VENTILATION.—THE FOLLOWING REPORT WAS SUBMITTED
TO THE HEALTH COMMITTEE DURING THE YEAR.

REPORT OF THE MEDICAL OFFICER OF HEALTH ON SEWER
VENTILATION.

“In accordance with the instructions of your Committee I beg to present to you my report on Sewer Ventilation.”

I have as far as possible confined my remarks to that part of the subject which bears most closely upon public health, and have necessarily omitted technical engineering details, upon which I am unqualified to give an opinion.

It may be assumed that under ordinary circumstances the ventilation of sewers is necessary, and that in districts where no efficient provision is made for ventilation evil effects are likely to arise. Putting aside those instances of sudden death in the case of workmen employed in sewers, due to asphyxia from inhaling the gaseous products of sewage decomposition in a concentrated form, in old and foul sewers of deposit, it is well-known that the continuous breathing of air polluted with the emanations from sewers has an injurious effect upon the health of those who are subject to it. It is also probable that besides the general ill-health which may be caused in this way, the infectious matter thrown off from certain specific diseases may enter the sewers and be either the direct or indirect means of conveying to the community the contagion of such disease. It has been proved that infectious diseases are associated with the growth and multiplication in the system of specific micro-organisms or minute or low forms of vegetable life, and in regard to some of them the proof is complete that these organisms are the actual contagia or cause of disease, and in regard to others that their development in the system results in the formation of poisonous substances which may in these cases be regarded as the immediate cause of the disease. These micro-organisms or poisons when cast off as waste products from the bodies of persons suffering from disease, may pass into sewers and become a source of danger in their underground travels through the district. Fortunately most of the disease producing germs are soon destroyed by exposure to light and air, hence the advantage of freely diluting the air of sewers with pure fresh atmospheric air.

It is probable that the spread of infectious disease by means of sewers would be much more frequent than it is were it not for the fact that the micro-organisms are solid particles and not volatile, they cannot easily rise in the air from moist substances, but when dry they may be freely blown about as dust and contaminate air, food, and water, or they may under exceptional circumstances be lifted into the air with gas bubbles. The sewers however must be in an unusually bad condition for such excessive evolution of gas to take place.

Dr. J. B. Russell, the able and distinguished Medical Officer of Health for Glasgow, states that ‘microbes are rarely liberated from the liquids which contain them, and that moist substances or surfaces may be loaded with them, but mere evaporation will not raise them into the air,’ and further, ‘that he has no fear that any sort of disease producing microbe after it once reached the sewer will ever turn up again alive.’ Dr. Russell of course excludes those cases in which the sewers discharge into potable rivers and where drains leak into local wells, otherwise he says ‘that for pathogenic microbes the sewer is the broad road which leads to destruction.’

Generally the air of an ordinary well-constructed sewer is much less impure than one would expect. Chemically the chief difference is in the higher proportion of carbonic acid and volatile organic matters. The proportion of micro-organisms may even be less than in the outside air, from whence indeed they are mostly derived.

Investigations on this subject have been made by Drs. Carnelly and Haldane, in connection with the main sewer of Westminster Palace, and with various sewers in Dundee where ventilation is carried out by means of open gratings placed in the roadway. The general conclusions were as follows :—

- (1) The CO_2 was about twice, and the organic matter about three times as great as in the outside air at the same time.
- (2) The number of the micro-organisms were less in sewer air than in the outside air at the same time.

More recently, in 1888, a report has been presented to the London County Council by Mr. J. Parry Laws, F.J.C., in which he states that the results of his experience on the London Sewers point unmistakably to the conclusions that the principal, if not the only source of micro-organisms in sewer air, is the air without the sewer and not the sewage, and they also tend to prove that there is very little ground for supposing that the micro-organisms of sewage, in the absence of violent splashing, become disseminated in the sewer air. The experiments shewed that the micro-organisms in the sewer air are related in kind to those in the outer air and not to those in the sewage, and further that there was complete absence in the sewer air of those forms of microbes which are discharged from the human body either in health or in disease, and which are present in enormous numbers in the sewage itself.

In a further report to the Council by Mr. Laws and Dr. Andrewes state that in the London sewers they were unable to find either the bacillus of typhoid fever or the bacillus of diphtheria, two diseases which have been freely attributed to sewer air and to the pollution of water with sewerage. They subsequently searched in a drain from the typhoid block of the East London Fever Hospital at Homerton and found in the sewage bacilli of typhoid fever when for the purposes of the experiment the ordinary disinfection of the excreta had been suspended. A week or two later however they examined the sewage about a quarter of a mile from the hospital but failed to find any of the bacilli. Messrs. Laws and Andrewes conclude their report by stating that 'It seems clear that sewage does not form a medium in which much if any growth of typhoid bacilli is possible under natural conditions, and that their death is probably only a matter of a few days or at most one or two weeks. That sewage is a common medium for the dissemination of typhoid fever is certain; that sewage polluted soil may give up germs to sub-soil air is possible; but that the air of sewers themselves should play any part in the conveyance of typhoid fever appear to us, as the result of our investigations, in the highest degree unlikely.'

In the Annual Report of the Medical Officer of the Local Government Board, for 1894-95, it is pointed out however by Dr. Klein, in reference to the investigation of Messrs. Laws and Andrewes, that the typhoid bacillus multiplies abundantly and retains its vitality for a long time when nitrates are present in the fluid which is used for the artificial culture of the bacillus, and that these salts would in all probability be present in the soil through which, under natural conditions, the sewage might percolate and in the water which was polluted with sewage. Dr. Thorne-Thorne, the Chief Medical Officer of the Board, in alluding to Dr. Klein's experiments, states 'that he has conclusively shown that the belief in the inability of the typhoid bacillus to thrive in sewage has no sufficient basis in fact.' Whatever conclusions may be drawn from the observations of Messrs. Laws and Andrewes, or from those of Messrs. Carnelly and Haldane, it is clear that Sanitary Authorities have still imposed upon them the duty of keeping their sewers in such a state as not to be a nuisance or in any way injurious to health. For even supposing that such diseases as typhoid fever and diphtheria cannot be directly connected with the inhalation of sewer gas, it may with confidence be asserted that a predisposition to take such diseases is produced thereby, and that chronic poisoning characterized by nausea, diarrhoea, and general prostration may be caused in the same way. Attacks of acute illness, especially in the puerperal state, or in persons who have recently undergone surgical operations, are under such circumstances by no means rare, for it must not be assumed that because observers have failed to detect in sewer air certain pathogenic organisms this air is therefore harmless. In any case noxious chemical substances are evolved varying in nature with the condition of the sewer, which produce ill effects, although not necessarily any of the ordinary infectious diseases. The speedy removal of sewage from dwellings and its discharge in some harmless manner at an outfall far away from the population, is the essential feature of a good system of sewerage, and without which the health of the community will undoubtedly suffer.

The movement of air in sewers, when no artificial means of ventilation are used, depends upon the physical properties which are common to atmospheric air and gases in general. Air has weight and is acted upon like other bodies by the force of gravity, and its movements are due to the difference

of weight of adjacent and equal volumes, the difference of weight depending upon the temperature and pressure to which each volume of air is subject, and the proportion of watery vapour which it contains. The movement is also very largely dependent upon the force and direction of the wind, which acts either by inducing a vacuum in the sewer, or by blowing directly into an opening in it. In summer the temperature of the sewer air is generally lower and in winter higher than that of the outer air. Any sudden variation either in the temperature of the air or in the barometrical pressure producing corresponding expansion or contraction in the air of the sewer. With a falling barometer it will expand and have a tendency to rise out of the street gratings. Although therefore the laws which govern the movement of air and gases are well understood, the conditions which exist in a system of sewers are sometimes so complex that ventilation becomes a matter of no small difficulty. The difficulties appear to be so insurmountable that in some places there is a tendency to follow the example of Bristol and to abandon sewer ventilation altogether, especially as in this city no evil consequences seem to have resulted from its absence. The whole question is probably more one of designing sewers with self-cleansing gradients and velocities than one of ventilation. When offensive smells arise from a sewer it is generally a sign that the sewer is one of deposit and that is not self-cleansing. It is for engineers to discover and remedy the cause of evil. Closing a street ventilator or erecting a tall shaft may do away with the obvious nuisance, but it will not improve the condition of things in the sewer; such a proceeding may, indeed, tend to perpetuate the real danger by withdrawing attention from the defect. If sewers are well constructed and have suitable gradients, and are at all points thoroughly and systematically flushed, the ventilation is really a matter of minor importance, provided, of course, that house drains are properly disconnected from the sewer. Unfortunately, these favourable conditions seldom exist in practice, and in most places therefore sewer ventilation cannot be abandoned. In times of drought in the summer, when the sewers require an unusual amount of flushing, they are deprived of the natural means of cleansing by the absence of rainfall, and at the same time a scarcity of the public water supply may seriously interfere with the ordinary flushing arrangements.

The ventilation of public sewers is, of course, entirely independent of the ventilation of private house drains. In the former case the Sanitary Authority is responsible, in the latter the owner of the property, who may however be controlled in this matter by bye-laws. All house drains should be disconnected from the sewer in such a manner that it is impossible for the air from the sewer to enter the house. This is effected by the insertion of a trap in the drain as near as possible to the point of its connection with the sewer, by ventilating the drain on the house side of this trap, and by continuing the soil pipe in its full diameter above the level of the roof of the house. By this means the fresh air entering by the ventilator near the trap passes along the whole drain and issues from the top of the soil pipe, a current of fresh air is thus constantly circulating through the house drain. Full details of this method are contained in a recent report presented to you by your Borough Engineer. Sewer ventilation as first practised was carried out in an irregular and unintentional manner by means of untrapped rain water pipes or other pipes connected with the house drainage. Subsequently, to relieve the pressure of air in the sewers, open gratings at the street level, connected with manholes, were introduced, and these have now become the usual means of ventilating sewers. The system of vertical shafts, usually manholes, opening in the roadway, and leading directly to the crown of the sewer beneath, is the one which is adopted in Cardiff. Mr. Harpur, M.I.C.E., the Borough Engineer, informs me that the ventilators are placed about 75 yards apart in the greater part of the district. In some very few instances the consent of the owner of a building has been obtained to erect a high iron ventilating shaft against his premises. Sir Robert Rawlinson advises in connection with ventilators opening at the street level, "that they should be provided for on all sewers at frequent intervals not greater than 100 yards apart," and adds the very suggestive remark "if, however, it is found that some of the ventilators are a nuisance, additional sewer ventilation should be provided at shorter intervals." There are, I believe, few towns in which the nuisance from ventilators at the surface of the street has not been at times complained of. The replies to my enquiries, which are appended to this report, fully bear out this statement. Granting that these complaints are by no means without foundation, it must be acknowledged that the danger to health would be much greater if this ventilation were abandoned. The discharge of gases from the sewer into the middle of the road, as far as possible from dwellings, and where they are freely diluted with fresh air, is much less dangerous than the discharge of such gases through house drains or street gullies near the footpath, which must of necessity take place if the sewer is imperfectly ventilated, or if from any other cause the pressure of air in the sewer is largely increased. If the openings into the crowns of sewers be sufficiently numerous, there cannot be at any time pressure enough to force the traps on house drains or street gullies.

The road ventilators will at times act as outlets for sewer gas, and at other times as inlets for fresh air, this depending on a variety of causes, such as barometrical pressure, direction and force of the wind, and the relation between the temperature in the sewer and that of the external air. Sewers discharging into the sea or into tidal rivers, as in Cardiff, are liable to be tide-locked periodically. During this period, as they fill up with sewage, sewer air will be expelled, and when the sewers discharge on the ebb tide, fresh air will be drawn in at the openings at the sewer. In consequence of these conditions any system of up-cast or down-cast shafts which may be arranged for the purpose of producing a current of air will be entirely ineffectual, as all shafts will act as up-cast shafts when the sewers are tide-locked and the sewage is being backed up in them, and as down-cast shafts when the sewage is discharging. Various methods have from time to time been suggested with a view of preventing the nuisance from ventilators, none of which, however, have been at all generally adopted. Amongst these may be mentioned the following:—

(1). Sewers have been connected with furnace chimneys, but although a great velocity in the sewer air has been produced, this effect has been only for a short distance from the furnace, as the external air rushes through the nearest street openings, or possibly traps may become unsealed in order to supply air for the furnace, the air in the sewer at a distance from the furnace remaining more stagnant than if no such system had been adopted. This was proved by experiments on a large scale made in 1888 by Sir Joseph Bazalgette upon the London sewers at Westminster, where a furnace was connected with a large up-cast shaft. Speaking of these experiments Sir Joseph Bazalgette says:—‘A furnace ventilating any large district would require to produce a very large volume of air and to keep up a velocity sufficient to ventilate the branch sewers, and the drag would be so great through the main that it would force open any house drain traps or water traps we could form before it would influence the remote branches.’ The results of these experiments have been confirmed by subsequent observations.

(2). In some towns ventilating pipes have been carried from the drain on the sewer side of the disconnecting trap to the top of the house, the gratings at the street level being closed on complaint of nuisance. This may possibly remove an obvious nuisance from one locality, but the result of such a system would be a partial and incomplete ventilation. If the street gratings were allowed to remain open, this system of pipes would probably be an excellent way of ventilating the sewer. The gratings under these circumstances would generally act as inlets and the high pipes as outlets. At times in the summer or under certain conditions of the atmosphere, the current of air might be reversed, but we should then be in no worse position than we are at present. Unfortunately, the practical application of this plan is surrounded with difficulties; its success depends upon its general adoption, and in each case the consent of the owner is required to the erecting of a ventilating shaft on his premises. This consent can rarely be obtained.

(3). Baskets filled with charcoal were formerly placed in the manholes for the purpose of removing the smell from the ventilators, but it was soon found that unless they were frequently removed they were worse than useless; they became wet and clogged and obstructed the ventilation. They have now been nearly everywhere abandoned.

(4). Mr. G. F. Harrington, of Ryde, introduced a system of ventilating sewers by making provision for the entry of air into the sewers by means of a shaft with a revolving cowl at its upper end and so arranged that its mouth is always presented to the wind. Air will enter through the cowl and descend through the shaft to the sewer, to be extracted at a distance varying from 300 to 500 feet, by a shaft which terminates above in an open end. Professor Corfield, from whose work on the “Treatment of Sewage” this information is obtained, states that this system was tried as an experiment on some of the sewers belonging to the Chelsea Vestry with good results.

(5). It has been proposed to put a large ventilating shaft at the head of every sewer, either in lieu of or in addition to the openings at the street level, but it appears that when the street openings are closed the amount of sewer air passing through the shaft is quite insufficient to ventilate the sewer, and that when they remain open the ventilation extends to a very short distance beyond the nearest ventilator in the road.

(6). Recently the principle of the ‘Destructor’ has been applied to sewer gas. ‘The Keeling-Holman Sewer Gas Exhauster and Destructor’ has in some places been adopted with the intention of destroying sewer gas and any injurious matter which it may contain. The system, which has been introduced at Ealing, Richmond, Winchester, and Reading, is an arrangement of lamp columns

with a 6-inch connexion from the sewer for passing sewer air through an atmospheric gas-burner fixed in the base of the column, the outlet being about 10 feet above ground, under an ordinary street lamp placed at the top of the column. It is stated that by a consumption of 8 cubic feet of gas every hour, 2,500 to 3,000 cubic feet of sewer air can be extracted per hour. These destructors have not yet been adopted on a sufficiently extensive scale to enable a reliable opinion to be given as to their efficacy. Dr. Hill, Medical Officer of Health for Birmingham, states as his experience that they are expensive without being efficient.

The enquiries which I have addressed to the Medical Officers of Health of various towns were directed to the following points relating to sewer ventilation :—

- (1). The method of ventilation adopted.
- (2). Whether the method was approved by the Health Officer ?
- (3). Whether complaints of nuisance from ventilators were numerous ?
- (4). Whether there was reason to suppose that illness had been caused by the system adopted ?

The full replies which I obtained are appended to this report, but for convenience of reference I submit for your consideration the following summary :—

Out of 45 towns from which replies were received, there were 18 in which the sewers were ventilated entirely by ventilators opening at the street level. In 8 of these towns this system was approved by the Medical Officer of Health. In 7 there was a decided disapproval, and in the remainder the approval was qualified. In 24 of the towns the ventilators opening at the street level were supplemented by pipes carried above houses and in a few cases connected with factory chimneys. To this system there is an unqualified approval on the part of the Medical Officers of Health in 6 towns. In 5 towns the pipes carried above houses are approved of but not the ventilators at street level. In 6 this system is approved, but the manner in which it is carried out is objected to on the ground of an insufficient number of pipes. Altogether out of 45 towns there were 42 in which there were ventilators opening at the street level, and in 21 of these the complaints of nuisance were stated to be numerous and in 16 not numerous. In the remainder the complaints were confined to particular districts in the warm weather. In 2 towns the sewers were ventilated by means of cast iron pipes carried from 30 to 80 feet high, and without any street ventilators. Bristol is the only town of any size in which the sewers are not ventilated at all, and this system is approved by the Medical Officer of Health and City Engineer who desire no change. To the question whether there was reason to connect illness with the system of ventilation adopted, the replies were only definitely in the affirmative in 6 instances. In 11 towns the Medical Officer of Health had some reason to suspect that illness had been caused by the street ventilators. In the remaining 28 there was no reason to connect illness with the ventilators.

After a careful consideration of the facts which I have been able to collect, I believe that there is very little reliable evidence to show that the ordinary specific infectious diseases are caused by inhaling sewer gas, and that usually where sewage is responsible for their causation the mischief has arisen through swallowing either water or food which has become contaminated with sewage matters. My own experience is certainly in the same direction. In Cardiff, during the past few years, typhoid fever has been of comparatively infrequent occurrence, and the only extensive outbreak of this disease since 1888 was certainly due to the milk supply in a particular locality having become polluted on the premises of a milk vendor. The cases of fever, some 40 in number, occurring within a very short time, were entirely confined to the consumers of milk from this one source, and the outbreak immediately ceased on the sale of this milk being stopped. The vital statistics of this and other large towns do not lead to the conclusion that sewer gas has in any way increased the prevalence of infectious diseases. We find that whilst sewers and consequently sewer ventilators have increased to a vast extent all over the country, these diseases have considerably diminished, and that this has been more particularly the case with typhoid fever, a disease which of all others has been most conclusively shown to be connected with poisoning by sewage matters. In Cardiff for instance, the average death rate from this disease, which was 19 per 10,000 of the population during the 10 years 1845-54, was reduced to 3 per 10,000 during the 10 years 1874-83. In the Registrar General's last report for the year 1894, we find that in Cardiff, with a population of 148,890, there were seven deaths from typhoid fever, while in the rest of South Wales with a population of 961,311 there were 175 deaths from this disease, giving a death rate per million persons of 40 for Cardiff, and 182 for the rest of South Wales.

The death rate from typhoid fever per 10,000 of the population during successive years since 1887, has been as follows in Cardiff as compared with the average in the 33 large towns of England and Wales :—

DEATH RATE PER 10,000.										
Years	...	...	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.
Cardiff	...	...	3.8	2.5	1.9	1.9	1.9	1.2	0.4	0.8
Large Towns	...	...	2.0	2.0	1.9	2.0	1.5	2.4	1.9	2.0

In the face of these figures it does not seem probable that emanation from sewers can be held responsible for an increase of typhoid fever in Cardiff or in the large Urban Districts of England and Wales.

In the same way we find of late years a marked diminution in the general mortality and in the mortality from the group of zymotic diseases in the large towns in which they are for the most part sewers and sewer ventilators in the streets. The following table gives the average annual deaths from all causes to 1,000 persons living in large Urban Districts, in decennial periods :—

1851-60.	1861-70.	1871-80.	1881-90.
24.7	24.8	23.1	20.3

In Cardiff the decrease in the general mortality has been still more marked, as will be seen by the following :—

1845-54.	1855-64.	1865-74.	1875-84.	1885-94.
32.7	26.7	23.6	20.0	20.7

whilst the average death rate for the four years 1892-95 was 18.1 per 1,000 persons.

The average annual death rate from the group of zymotic diseases has decreased in Cardiff from 9.8 per 1,000 during the ten years 1845-54 to 2.7 during the ten years 1885-94.

There is however one disease amongst the group of zymotics which has not responded to our efforts at sanitary reform. Diphtheria, which was formerly relatively more prevalent in rural than in urban districts, has of late years shown a tendency to increase in large cities and towns. For instance, in London the annual rate per million of the population has increased from 122 in the ten years 1871-80, to 259 in 1881-90, and since then the rate has been as follows :—

Years	...	...	...	...	1891.	1892.	1893.	1894.	1895.
Death rate per 1,000,000	...	...	...	...	340	462	760	625	529

In Cardiff the average death rate from this disease was 180 per million during the six years 1878-83. This rate has increased to 208 during the six years 1884-89, since then the rate has been as follows :—

Years	...	...	...	...	1890.	1891.	1892.	1893.	1894.	1895.
Death rate per 1,000,000	...	...	...	...	128	122	264	653	396	295

This increase, which has taken place chiefly in the large centres of population where sanitary reforms have been most actively carried out, seems to indicate that the development and spread of diphtheria is not very closely connected with sanitary defects, and that the improvements which have had such a marked effect upon other infectious diseases have done little towards stamping out diphtheria. Considerable difference of opinion exists amongst authorities as to the nature and extent of the influence exerted by insanitary surroundings in the spread of diphtheria.

I have in several reports expressed the opinion that owing to the extreme infectiousness of the disease, the aggregation of large numbers of children in schools is probably the most active agent in the spread of this disease. At the same time there can be no doubt that insanitary conditions and especially defects in drainage are at times responsible either directly or indirectly for the development of diphtheria. In the face of recent investigations which show the comparative freedom from microbes of sewer air, it does not seem probable that diphtheria can often be directly produced by inhaling such air. It is however very probable that a non-specific sore throat may be produced by the foul emanations from sewers, and that this non-specific inflammation of the tonsils and mucous surfaces of the throat may take on diphtheric action under certain conditions, the most favourable condition being of course close contact with a person suffering from diphtheria. It is in such cases that school attendance plays an active part in the spread of the disease by bringing together in the large public elementary schools large numbers of young children, amongst whom some may be suffering from a mild and unnoticed sore throat which may develop into true diphtheria.

In comparing the vital statistics of towns differently situated with respect to the methods of sewer ventilation, no indication is found of any influence either for good or evil on the health of the inhabitants of any particular method of sewer ventilation. The death rate of Bristol, in which city the sewers are unventilated, is as favourable as that of Brighton, where the most extensive system of sewer ventilation prevails. It is probable that in Bristol the gradients and flushing arrangements of the sewers are such as to produce a constant and rapid flow of the sewage, and in such cases it would seem that sewer ventilation may be abandoned without any evil consequences. In Cardiff however this condition cannot be always obtained, as the low-lying nature of the ground seriously interferes with the velocity of flow in some of the sewers, especially in times of unusual drought when the ordinary flushing of them is of necessity suspended.

In the foregoing report I have endeavoured to lay before you the chief points connected with sewer ventilation in so far as they relate to the medical and sanitary aspect of the question, and have indicated what, in my opinion, is the nature of the influence which sewer air has upon the public health. I have also obtained and tabulated certain information from other towns which I trust may be of service to you in the consideration of this matter. I have only to repeat that it is entirely the province of Engineers to design sewers in such a way and to maintain them in such a condition that they will be self-cleansing and free from the deposit of anything which will cause an offensive or dangerous smell. It is also their province to advise upon the exact method of ventilation which should be carried out.

There are, however, certain measures of domestic sanitation upon which it is the duty of the Medical Officer of Health to advise, and which are closely connected with the condition of public sewers. I consider that it is absolutely essential that in the construction of new houses provision should be made for the disconnection of house drains from the public sewer in the manner which I have already indicated, and that where possible this disconnection should be provided in old houses. Further, that in new houses all water closets should be provided with a suitable waste preventing flushing tank. If these measures were universally adopted it would be practically impossible for sewer air to obtain egress into houses, and the cleansing of public sewers would be greatly facilitated by the regular flushing of house drains."

SEWER VENTILATION.—Replies to Inquiries.

Towns.	Population.	System of Ventilation.	Is the system approved of by the Medical Officer of Health?	Has Medical Officer reason to connect illness with the system?	Are complaints of Nuisance numerous?
OXFORD	45,742	Ventilators opening at street level and pipes carried above house windows.	Does not approve of road ventilators.	Has had cause to suspect illness.	Yes.
LEEDS	402,449	In new sewers by ventilators in centre of street. In others by untrapped gullies at side of street.	Not altogether ...	Not been able to connect illness with system.	Yes.
PRESTON	113,864	By 9in. pipes opening in centre of street	Consider it to be the best in use.	No ...	Complaints occasionally received.
SCARBOROUGH	33,776	By 9in. shafts carried above buildings	Yes, if in sufficient numbers.	No ...	No.
NORTHAMPTON	61,012	By ventilators in centre of street	No	Suspects that illness is occasionally caused.	Yes, in warm weather.
BOURNEMOUTH	37,785	By standard (5in. to 9in. diameter) cast iron pipes 30ft. to 80ft. in height.	Yes	No ...	No.
BATH	51,844	By 6in. iron shafts about 30ft. high in higher levels.	Yes	No ...	No.
CARLISLE	39,176	By ventilating manholes in centre of street, and by shafts carried up factory chimneys.	Not as regards street ventilators.	No evidence of illness	Yes, from manholes.
WORCESTER	42,908	By road grids chiefly, a few shafts carried above houses.	Not in small streets	No proof of illness	Yes.
SUNDERLAND	140,386	Ventilators opening at street level. Many of them close to windows and doors, and to footpaths.	Not as carried out in Sunderland.	Considers that illness is caused by ventilation.	Yes.
READING	60,054	Ventilators opening at street level	Yes	No ...	Few.

SEWER VENTILATION.—Replies to Inquiries (*continued*).

Town.	Population.	System of Ventilation.	Is the system approved of by the Medical Officer of Health ?	Has Medical Officer reason to connect illness with the system ?	Are complaints of Nuisance numerous ?
EASTBOURNE	...	Ventilators opening at street level and high columns.	Does not approve of the number of road ventilators in proportion to the number of columns	No	Yes.
SOUTHAMPTON	...	Ventilators opening at street level	No	In few cases...	Yes, in dry weather.
WARRINGTON	...	Ventilating manholes in surface of streets	Considers it the best in use	Sometimes had reason to connect illness with system.	Occasionally.
GLOUCESTER...	...	Ventilating manholes in surface of street, and by shafts carried above houses.	Yes, if plenty of shafts are provided.	No	Yes.
EXETER	...	Ventilators opening at street level in new sewers, and by shafts carried above houses in old sewers	Not altogether.	No	No.
YORK	...	Ventilators opening at street level. Most of old sewers unventilated.	Yes	No	Nuisance has occasionally been caused by obstruction in sewer.
CHESTER	...	Ventilators opening at street level, supplemented by high shafts where possible.	Yes	No	Not very.
HULL	...	Ventilating manholes at surface of street	Yes	No	No.
CROYDON	...	Ventilators opening at surface of street, and by a few high shafts.	Yes	No	No.
NEWCASTLE-UPON-TYNE	212,223	Ventilators opening at surface of street	Not unreservedly	Has occasionally had reason to suspect so.	Yes, in certain localities.
BURNLEY	...	Ventilators opening at street level, and rain water pipes.	No	Yes	Yes.

SEWER VENTILATION.—Replies to Inquiries (*continued*).

Town.	Population.	System of Ventilation.	Is the system approved of by the Medical Officer of Health?	Has Medical Officer reason to connect illness with the system?	Are complaints of Nuisance numerous?
MANCHESTER	529,561	Ventilators opening at street level with a few high shafts.	Yes, conditionally	No	No.
LIVERPOOL	632,512	Ventilators opening at street level with a few high shafts.	Yes	No	No.
SALFORD	210,707	Ventilating manholes at street level. High shafts in narrow passages.	No reply	No	Yes.
LEICESTER	198,659	Ventilators opening at street level and high shafts.	Of shafts	Yes	No.
WOLVERHAMPTON	86,530	Ventilators opening at street level with high shafts in narrow streets.	Yes, conditionally	Not definitely	No.
BOLTON	120,380	Ventilating manholes at street level and pipe shafts in centre of street, except in narrow streets, where shafts are carried up above buildings.	Approve of shafts	Has reason to connect illness with manholes.	Yes, of manholes.
NOTTINGHAM...	229,775	Re-placing street ventilators by high shafts	Yes	No	Yes.
BRADFORD	228,809	Ventilators opening at street level	Yes	No	In particular districts.
OLDHAM	143,442	Ventilators opening at street level in centre of street, and by untrapped grids at side of street, and by rain water pipes.	Not the last feature	No	No.
BIRKENHEAD...	109,843	Ventilators opening at street level	No	Suspects that illness is caused.	Yes.
BIRMINGHAM...	501,241	Chiefly by ventilators opening at street level	Yes	No	Rather numerous, but frequently without cause.

SEWER VENTILATION.—Replies to Inquiries (*continued*).

Towns.	Population.	System of Ventilation.	Is the system approved of by the Medical Officer of Health?	Has Medical Officer reason to connect illness with the system?	Are complaints of Nuisance numerous?
GATESHEAD ...	98,486	Ventilators opening at street level ...	No ...	Yes ...	Yes.
NORWICH ...	108,690	Chiefly by ventilators opening at street level. High shafts have been substituted in some cases.	Approve of shafts ...	Yes, by street ventilators.	Fairly numerous.
BRIGHTON ...	120,499	Ventilators opening at street level, combined with high shafts.	Yes ...	No ...	No.
BLACKBURN ...	129,459	Open grids in street and rain water pipes ...	Undecided ...	No ...	No.
HUDDERSFIELD ...	100,463	Open manholes and untrapped gullies at side of street.	No ...	Several suspicious cases ...	Occasional.
DERBY ...	101,770	Ventilators opening in street level ...	Yes, ^{an} some better method is devised.	Yes ...	Fairly numerous.
HALIFAX ...	94,775	Ventilators opening at street level ...	Yes ...	No ...	No.
PLYMOUTH ...	90,276	Ventilators opening at street level and a few high shafts.	Not altogether ...	In a few isolated cases ...	Yes.
BRISTOL ...	280,623	Sewers not ventilated ...	Approves of the absence of ventilators.	No ...	...
SHEFFIELD ...	347,278	Ventilators at street level ...	Yes, if sewers are in good condition.	No ...	Yes, in dry weather.
SWANSEA ...	98,645	Ventilators opening at street level and a few high shafts.	Yes ...	Yes, in a few instances ...	Occasional.
IPSWICH ...	57,483	Ventilators opening at street level and high shafts.	Approves of the high shafts.	Illness has been attributed to road ventilators.	Not so many as formerly.

SALE OF FOOD AND DRUGS ACT.

The following articles were analysed during the year by Mr. Thomas Hughes, F.I.C., F.C.S., Borough Analyst.

Samples obtained.	Number of Samples.	Number of Genuine Samples.	Number of Samples Adulterated.	Fines.
Milk	356	352	4	£2 and costs. £4 and costs. £2 and costs. £1 and costs.
Butter	92	92	...	
Coffee	86	86	...	
Flour	18	18	...	
Bread	28	28	...	
Malt Vinegar	6	5	1	5/- and costs.
Cream	6	6	...	
Margarine	9	9	...	
Vinegar	6	3	3	5/- and costs in each case.
Cheese	24	24	...	
Ginger ^d	12	12	...	
				MARGARINE.—Exposing for sale without being properly labelled— Two 40/- and costs. 5/- and costs. Two dismissed. One £3 and costs. One cautioned. One £4 and costs. One for obstructing Inspector in execution of his duty. One 10/- and costs.
Total	593	585	8	

MAGISTERIAL PROCEEDINGS.

	No. of Cases.	Fines.		
		£	s.	d.
Proceedings under Sale of Food and Drugs Act	17	21	5	0
Proceedings under Section 126, Public Health Act, 1875	1	2	0	0
Proceedings under Shop Hours Act, 1892	1	0	10	0
Proceedings under Section 3, Infectious Disease Notification Act, 1889	2	1	10	0
Proceedings under Section 70, Public Health Act, 1875	2	Closing Order obtained.		

In conclusion I have the pleasure of reporting that your Inspectors of Nuisances have carried out their work in a satisfactory manner, and that they have as usual, paid the greatest attention to their varied and important duties.

I have the honour to be, Gentlemen,

Your obedient Servant,

EDWARD WALFORD, M.D.,

MEDICAL OFFICER OF HEALTH.

APPENDIX.

Report of Mr. D. VAUGHAN, Chief Inspector of Nuisances, and
Inspector of Canal Boats, for the Year 1896.

Nuisances inspected	...	...	...	...	...	...	3,078
Notices issued	...	...	...	...	...	...	2,871
Nuisances abated without legal proceedings	...	...	...	...	...	...	2,771
" " with " "	...	...	...	...	...	...	—
Animals kept so as to be a nuisance	...	...	...	...	...	...	27
Injurious and foul accumulations	...	...	...	...	...	...	548
Nuisances from smoke and offensive trades	...	...	...	...	...	...	6
Suspected samples of water obtained for analysis	...	...	...	...	...	...	—
Cesspools cleansed	...	...	...	...	...	...	3
" abolished	...	...	...	...	...	...	—
Defective drainage	...	...	...	...	...	...	1,023
Drains unstopped and cleansed	...	...	...	...	...	...	288
" trapped and repaired	...	...	...	...	...	...	287
" tested	...	...	...	...	...	...	550
Foul and offensive closets cleansed	...	...	...	...	...	...	65
Defective apparatus to water closets repaired	...	...	...	...	...	...	21
Water laid on to dwelling houses	...	...	...	...	...	...	25
" " to water closets	...	...	...	...	...	...	29
" " to urinals	...	...	...	...	...	...	13
Additional ventilation provided to rooms	...	...	...	...	...	...	2
Dilapidated and dirty houses cleansed and repaired	...	...	...	...	...	...	261
Overcrowding notices	...	...	...	...	...	...	13
Additional W.C. accommodation provided	...	...	...	...	...	...	12
DISINFECTION :—							
Houses disinfected	...	...	...	...	...	...	935
Articles of bedding and clothing disinfected	...	...	...	...	...	...	10,289
" " " destroyed	...	...	...	...	...	...	333
OFFENSIVE TRADES :—							
Premises visited	...	...	...	...	...	...	576
SLAUGHTER HOUSES AND MARKETS :—							
Visits paid to slaughter houses	...	...	...	...	...	...	191
" " markets	...	...	...	...	...	...	241
ARTICLES DESTROYED AS UNFIT FOR FOOD :—							
Beef	...	...	...	...	...	...	2,740 lbs.
Pork	...	...	...	...	...	...	880 "
Veal	...	...	...	...	...	...	70 "
Mutton	...	...	...	...	...	...	111 "
Game	...	...	...	...	...	...	95 "
BUTCHERS AND PROVISION SHOPS :—							
Inspected	...	...	...	...	...	...	695

COWSHEDS AND MILKSHOPS :—

Number of cowkeepers on register	...	...	...	...	...	56
„ milk sellers	„	...	...	...	...	535
Total						611
Number of cowkeepers registered during the year	...	...	...	...	...	4
„ milk sellers	„	„	„	...	...	107
Total						111
Number of cowsheds inspected	...	...	...	...	...	418
„ milkshops	...	...	...	...	...	1,103
Total						1,521
Notices served, written	...	...	...	...	...	207

COWSHEDS, MILKSHOPS AND DAIRIES.

PARTICULARS OF INSPECTION.						COWSHEDS.	MILKSHOPS.
Total number inspected	...	...	...	...	...	418	1103
Found in good condition	...	...	...	...	...	299	999
Impure water supply	...	...	...	...	...	1	...
Water Closets, Sinks, or Drains Defective	...	...	...	...	...	8	51
„ „ communicating with premises	...	...	...	...	...	...	...
Receptacles for manure erected	...	...	...	...	...	...	...
Cesspools	...	...	...	...	...	...	...
Yards badly paved and accumulations of rubbish	...	...	...	...	...	8	22
Dairies or milkshops used for purposes incompatible with proper preservation of milk	...	...	...	...	...	...	9
Dirty milk vessels	...	...	...	...	...	...	...
Infectious disease amongst persons employed	...	...	...	...	...	...	9
Swine kept on premises	...	...	...	...	...	...	1
Cowsheds with defective lighting, cleansing and ventilation, and lime washing	...	...	...	...	...	100	21
„ „ cattle disease	...	...	...	...	...	...	...
„ overcrowded	...	...	...	...	...	2	...

CANAL BOATS.

Number of boats on register	...	...	...	...	59
„ „ inspected	...	...	...	...	153
„ „ found in good condition	...	...	...	...	181
„ „ „ with wrong register number	...	...	...	...	8
„ „ „ „ defective ventilation	...	...	...	...	13
Number of notices served and complied with	...	...	...	...	21

Meteorological Observations for the Year 1896.

MONTH.	Attached Thermometer.	Barometer. Inches.	TEMPERATURE IN SHADE.								HYGROMETER.			RAINFALL.				DEATH RATE Per 1,000.	
			Maximum.	Minimum.	Mean of Maximum.	Mean of Minimum.	Mean of Month.	Earth.		Dry Bulb.	Wet Bulb.	Relative Humidity.	Amount in Inches.	Greatest Fall in 24 hours.	Date of Greatest Fall.	Days on which 0.01 or more rain fell.	All Causes.	Seven Chief Zymotic Diseases.	
								1 foot.	4 feet.										
January	54	30.336	53°·5	23°·5	46°·2	38°·1	41°·6	46°·0	46°·8	40°·5	39°·4	89	·64	·40	24th	6	14·3	0·81	
February	52	30.295	55°·0	23°·0	47°·3	45°·1	40°·8	45°·8	46°·8	39°·2	38°·1	92	1·39	·80	13th	9	14·8	1·18	
March	54	29.808	59°·8	27°·0	51°·8	39°·3	45°·9	47°·8	47°·8	46°·2	43°·6	82	4·47	·54	7th	24	14·7	1·10	
April	56	30.254	63°·0	29°·0	57°·2	41°·1	48°·0	53°·5	51°·2	50°·0	46°·6	78	2·83	·80	15th	14	13·6	0·96	
May	61	30.263	75°·8	28°·0	65°·7	44°·9	52°·9	61°·5	56°·0	57°·3	51°·2	65	·22	·14	13th	3	18·1	2·01	
June	66	29.951	82°·5	52°·5	66°·9	51°·9	61°·4	66°·8	59°·8	63°·0	57°·9	71	2·48	1·00	7th	11	14·7	1·99	
July	67	30.385	82°·5	40°·0	71°·8	51°·0	61°·4	61°·5	62°·5	62°·5	57°·3	70	1·14	·35	24th	8	17·4	1·61	
August	64	30.048	71°·2	58°·8	66°·8	50°·4	58°·6	62°·0	57°·8	59°·5	55°·5	76	2·89	·84	19th	15	21·5	1·69	
September	63	30.012	69°·8	37°·8	63°·5	50°·2	56°·8	60°·0	57°·8	56°·9	54°·2	83	7·34	1·10	17th	23	13·5	1·40	
October	57	29.659	64°·5	24°·5	53°·5	38°·9	46°·2	58°·5	58°·0	45°·9	43°·5	83	4·65	·74	5th	19	17·0	1·10	
November	51	30.131	51°·2	21°·2	46°·5	33°·3	39°·9	44°·5	51°·0	39°·6	37°·4	82	·96	·60	15th	5	19·1	1·90	
December	49	29.088	52°·5	28°·8	45°·8	34°·5	40°·0	48°·0	46°·0	40°·3	38°·0	81	6·41	·72	4th	22	25·8	1·60	

Mean Temperature of each month in the year, as compared with that of the previous five years.

MONTH.	1891	1892	1893	1894	1895	MEAN OF 5 YEARS.	1896
January ...	35°8	36°2	36°8	39°4	35°5	36°3	41°6
February ...	41°6	38°6	42°2	43°0	29°3	38°9	40°8
March ...	40°8	35°9	47°1	44°4	41°6	41°9	45°9
April ...	45°5	43°2	53°0	47°0	47°9	47°3	48°0
May ...	50°9	50°7	57°3	49°7	54°4	52°6	52°9
June ...	60°2	54°5	62°4	57°1	58°5	58°5	61°4
July ...	60°2	64°1	63°6	60°3	60°0	61°6	61°4
August ...	56°4	61°3	64°8	57°5	59°0	59°8	58°6
September ...	57°0	56°0	57°1	53°2	59°7	56°6	56°8
October ...	48°8	42°9	51°0	50°3	46°7	47°9	46°2
November ...	41°7	43°8	43°2	47°2	47°2	44°6	39°9
December ...	40°4	35°8	42°1	41°8	40°0	40°0	40°0

6830
570
5187
432
570
1001
101

The following Table illustrates the daily direction of Wind throughout the year 1896.

Direction of Wind.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year 1896.
N.	1	...	...	2	...	6	1	1	11
N.E.	...	3	5	2	2	13	3	...	2	4	18	9	61
N.W.	...	4	5	7	2	4	2	...	10	10	3	1	49
N.N.E.
N.N.W.
S.	3	3	1	...	1	2	3	1	10	...	27
S.E.	...	2	3	2	...	...	2	6	1	6	1	4	33
S.W.	...	13	1	16	15	1	5	12	3	9	3	8	89
S.S.E.
S.S.W.
E.	...	8	7	...	1	8	5	2	2	1	2	...	38
W.	...	1	5	1	9	4	12	6	10	1	2	3	58

TABLE SHEWING RAINFALL AT CARDIFF IN EACH MONTH, DURING THE TWENTY-ONE YEARS, 1876-1896.

YEAR.	JANUARY.				FEBRUARY.				MARCH.			
	Rainfall in Month. Inches.	Dayson which 0·01 or more rain fell.	Greatest fall in 24 hours.	Date of greatest fall.	Rainfall in Month. Inches.	Dayson which 0·01 or more rain fell.	Greatest fall in 24 hours.	Date of greatest fall.	Rainfall in Month. Inches.	Dayson which 0·01 or more rain fell.	Greatest fall in 24 hours.	Date of greatest fall.
1876	1·91	12	0·68	2nd	5·83	22	0·90	14th	3·92	22	0·54	9th
1877	5·77	27	0·72	3rd	2·79	20	0·42	11th	2·66	21	0·55	23rd
1878	1·73	17	0·36	27th	3·07	16	0·87	27th	1·25	8	0·40	28th
1879	5·95	10	1·30	1st	5·95	23	0·86	20th	1·14	14	0·32	23rd
1880	0·87	11	0·42	13th	3·88	22	1·06	18th	1·90	12	0·75	2nd
1881	0·92	12	0·23	26th	4·81	15	1·12	9th	3·88	16	0·68	3rd
1882	3·19	13	0·82	2nd	2·56	15	0·60	28th	2·26	19	0·32	1st
1883	5·75	25	1·11	24th	3·73	20	0·65	10th	0·60	10	0·12	13th
1884	6·03	21	0·99	31st	4·40	22	1·35	17th	3·89	16	1·27	3rd
1885	3·71	20	0·58	9th	3·65	22	0·67	26th	1·87	16	0·53	29th
1886	5·03	23	0·91	30th	1·32	11	0·62	28th	3·97	13	0·68	20th
1887	2·76	15	0·73	7th	1·45	6	0·73	3rd	3·21	10	1·16	15th
1888	1·70	12	0·49	1st	1·07	9	1·09	2nd	4·62	15	0·76	24th
1889	1·58	10	0·58	9th	2·00	16	0·64	10th	3·89	16	1·17	8th
1890	5·21	24	0·61	26th	0·55	7	0·22	19th	1·52	14	0·28	24th
1891	3·58	13	1·26	23rd	0·05	2	0·03	2nd	1·76	16	0·31	15th
1892	2·10	15	0·70	16th	2·38	19	0·58	20th	1·18	6	0·48	15th
1893	2·38	19	0·94	12th	6·04	22	0·95	25th	0·31	6	0·14	2nd
1894	3·20	23	0·44	19th	3·68	20	0·78	17th	3·37	13	0·82	1st
1895	3·88	20	0·71	19th	0·17	4	0·08	24th	3·92	21	0·85	27th
1896	0·64	6	0·40	24th	1·39	9	0·80	13th	4·47	24	0·54	7th

TABLE SHEWING RAINFALL AT CARDIFF IN EACH MONTH, DURING THE TWENTY-ONE YEARS, 1876-1896.

YEAR.	APRIL.				MAY.				JUNE.			
	Rainfall in Month. Inches.	Dayson which 0·01 or more rain fell.	Greatest fall in 24 hours.	Date of greatest fall.	Rainfall in Month. Inches.	Dayson which 0·01 or more rain fell.	Greatest fall in 24 hours.	Date of greatest fall.	Rainfall in Month. Inches.	Dayson which 0·01 or more rain fell.	Greatest fall in 24 hours.	Date of greatest fall.
1876	1·91	17	0·38	28th	0·23	4	0·12	24th	1·91	9	0·52	15th
1877	2·90	20	0·52	20th	2·47	14	0·99	16th	1·48	12	0·41	1st
1878	4·10	21	0·75	9th	4·32	24	0·71	16th	3·68	15	1·65	16th
1879	2·64	17	0·73	19th	2·85	15	0·88	29th	6·48	23	1·64	30th
1880	1·98	13	0·40	5th	1·45	11	0·46	26th	2·38	19	0·53	17th
1881	1·44	7	0·60	13th	2·62	10	1·73	17th	3·59	18	0·63	16th
1882	5·68	20	0·60	12th	2·72	13	0·59	22nd	4·28	20	0·82	5th
1883	0·67	7	0·28	26th	1·90	12	0·70	11th	18·1	17	1·16	27th
1884	1·56	11	0·43	3rd	2·37	14	0·50	2nd	1·92	9	1·11	28th
1885	2·52	16	0·67	1st	3·86	27	0·71	19th	2·61	13	1·04	23rd
1886	2·98	15	0·73	7th	6·38	19	1·52	31st	0·70	7	0·28	1st
1887	1·63	10	0·45	26th	1·94	14	0·63	19th	0·60	4	0·51	2nd
1888	1·48	13	0·30	17th	1·69	8	0·40	17th	3·69	17	0·74	17th
1889	3·54	18	0·71	30th	2·51	16	0·38	31st	0·58	6	0·41	1st
1890	1·80	14	0·34	6th	1·99	13	0·66	9th	2·46	17	0·40	10th
1891	2·02	11	0·40	2nd	3·41	17	0·75	21st	2·47	12	1·30	24th
1892	1·27	9	0·43	20th	1·35	11	0·66	27th	1·93	10	0·61	28th
1893	0·29	5	0·16	1st	2·80	12	0·72	19th	0·67	9	0·23	22nd
1894	2·05	15	0·41	23rd	2·18	15	0·50	15th	2·43	16	0·64	3rd
1895	2·08	12	0·55	24th	0·50	3	0·41	31st	1·15	9	0·32	30th
1896	2·83	14	0·80	15th	0·22	3	0·14	13th	2·48	11	1·00	7th

TABLE SHEWING RAINFALL AT CARDIFF IN EACH MONTH, DURING THE TWENTY-ONE YEARS, 1876-1896.

YEAR.	JULY.				AUGUST.				SEPTEMBER.			
	Rainfall in Month. Inches.	Dayson which 0·01 or more rain fell.	Greatest fall in 24 hours.	Date of greatest fall.	Rainfall in Month. Inches.	Dayson which 0·01 or more rain fell.	Greatest fall in 24 hours.	Date of greatest fall.	Rainfall in Month. Inches.	Dayson which 0·01 or more rain fell.	Greatest fall in 24 hours.	Date of greatest fall.
1876	1·91	10	0·41	6th	6·06	27	2·72	19th	7·08	19	1·28	30th
1877	4·94	18	1·27	14th	5·70	21	1·14	27th	3·25	8	1·39	27th
1878	2·01	9	0·78	23rd	10·82	24	3·64	15th	3·21	9	1·28	22nd
1879	4·00	21	0·81	19th	8·12	22	1·84	27th	4·85	17	0·69	7th
1880	3·64	23	0·95	17th	0·77	7	0·27	2nd	3·67	15	0·77	17th
1881	2·62	15	0·77	30th	6·94	20	1·45	22nd	2·09	13	0·48	22nd
1882	5·77	24	0·84	6th	6·75	16	1·14	22nd	3·94	17	0·79	28th
1883	3·56	21	0·82	20th	2·09	16	0·73	8th	6·14	19	1·53	23rd
1884	4·05	20	0·94	23rd	2·21	9	0·84	31st	1·96	15	0·64	21st
1885	0·72	6	0·81	18th	2·74	12	1·07	6th	6·51	23	1·76	10th
1886	4·85	17	0·71	29th	1·68	9	0·44	9th	4·08	14	0·75	4th
1887	1·51	13	0·85	26th	2·88	11	1·02	16th	4·07	17	1·24	1st
1888	6·88	25	1·16	7th	3·50	17	0·74	29th	1·21	8	0·52	27th
1889	3·85	12	1·16	9th	3·90	15	0·65	2nd	2·09	9	1·53	23rd
1890	3·57	19	0·73	17th	3·95	20	0·95	9th	1·57	11	0·50	17th
1891	2·21	17	0·36	2nd	7·19	22	1·10	26th	2·43	19	0·51	3rd
1892	3·83	9	1·50	12th	4·64	16	1·62	27th	3·95	14	1·88	29th
1893	3·88	17	0·80	10th	3·05	14	0·52	20th	2·03	15	0·89	28th
1894	4·22	20	0·97	24th	4·55	18	1·55	25th	2·22	10	0·80	22nd
1895	4·71	15	0·94	23rd	4·08	17	1·19	12th	1·17	10	0·40	6th
1896	1·14	8	0·35	24th	2·89	15	0·84	19th	7·34	23	1·10	17th

TABLE SHEWING RAINFALL AT CARDIFF IN EACH MONTH, DURING THE TWENTY-ONE YEARS, 1876-1896.

YEAR.	OCTOBER.				NOVEMBER.				DECEMBER.				YEAR.
	Rainfall in Month. Inches.	Days on which 0.01 or more rain fell.	Greatest fall in 24 hours.	Date of greatest fall.	Rainfall in Month. Inches.	Days on which 0.01 or more rain fell.	Greatest fall in 24 hours.	Date of greatest fall.	Rainfall in Month. Inches.	Days on which 0.01 or more rain fell.	Greatest fall in 24 hours.	Date of greatest fall.	
1876	3.84	17	0.62	16th	5.27	18	0.75	12th	7.13	23	0.80	17th	46.62
1877	4.89	16	1.15	24th	6.54	25	1.06	24th	3.40	25	0.88	28th	46.79
1878	5.76	18	1.09	23rd	5.76	13	0.84	9th	2.70	10	0.75	28th	45.71
1879	1.51	12	0.35	19th	0.43	8	0.18	20th	2.11	9	0.79	31st	44.79
1880	4.94	15	1.45	25th	3.67	15	0.90	15th	6.70	20	1.09	14th	38.85
1881	3.23	13	0.72	22nd	4.98	23	0.65	26th	4.50	15	1.77	7th	41.62
1882	3.33	23	1.04	23rd	6.26	21	0.90	7th	4.86	25	0.73	31st	56.60
1883	4.23	17	0.61	15th	6.38	24	0.80	21st	1.92	17	0.57	10th	38.78
1884	1.01	17	0.35	8th	2.12	16	0.47	30th	5.87	20	0.68	5th	36.89
1885	5.59	22	1.80	22nd	5.47	16	1.11	27th	1.74	17	0.05	5th	40.99
1886	5.09	21	0.87	15th	5.39	21	1.03	5th	6.64	21	1.33	26th	48.11
1887	2.80	13	1.14	29th	3.48	21	0.69	3rd	3.46	20	0.75	12th	29.79
1888	1.74	11	0.52	28th	7.04	26	1.13	12th	3.61	16	0.88	27th	38.18
1889	3.77	25	0.48	8th	1.87	12	0.75	24th	2.40	14	0.80	21st	31.38
1890	1.92	16	0.41	7th	3.89	20	0.67	6th	0.80	4	0.33	18th	29.23
1891	7.12	22	1.32	18th	3.91	15	0.74	28th	6.19	19	0.78	30th	42.34
1892	2.64	15	0.51	27th	3.25	18	0.66	4th	2.23	12	0.62	1st	22.63
1893	5.98	21	1.29	4th	2.30	13	0.58	1st	4.18	19	0.94	12th	33.91
1894	4.91	14	1.05	24th	4.72	20	0.83	13th	3.66	20	0.51	17th	41.19
1895	3.67	15	0.94	3rd	4.21	23	0.60	5th	3.45	31	0.48	17th	32.64
1896	4.65	19	0.74	5th	0.96	5	0.60	15th	6.41	22	0.72	4th	35.42

LOCAL GOVERNMENT BOARD TABLES.

TABLE OF DEATHS DURING THE YEAR 1896, IN THE CARDIFF URBAN SANITARY DISTRICT, CLASSIFIED ACCORDING TO DISEASES, AGES, AND LOCALITIES.

MORTALITY FROM ALL CAUSES, AT SEVERAL AGES.										MORTALITY FROM SUBJOINED CAUSES, DISTINGUISHING DIARRHOE OF CHILDREN UNDER FIVE YEARS OF AGE.																					
NAMES OF LOCALITIES adopted for comparison of these tables; public institutions being shown as separate localities.	(b) : (c) (d) (e) (f) (g) (h)						(i)	FEVERS.																							
	Under 1 year.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 50.	55 and upwards.		Small Pox.	Scarlatina.	Diphtheria.	Membranous Croup.	Typhus.	Enteric or Typhoid.	Continued.	Relapsing.	Puerperal.	Cholera.	Erysipelas.	Menses.	Whooping Cough.	Marasmus and Dysentery.	Rheumatic Fever.	Furunculæ.	Pneumonia, and Pleurisy.	Heart Disease.	Influenza.	Injuries.	All other Diseases.	Total.		
Cardiff Urban Sanitary Dis-							Under 5	8	40	13	5	1	...	...	...	...	...	4	86	99	112	...	...	6	255	5	2	18	607	1,201
trict ...	2405	890	311	112	148	685	259	5 upwards	1	14	2	6	...	...	3	...	...	1	3	6	6	7	151	241	109	4	59	591	1,204	
Cardiff Sanatorium	31	...	17	8	...	6	5 upwards	8	8	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	17
Union	2256	24	12	2	10	116	62	5 upwards	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	43	29	21	...	3	99	200
Infirmary	110	9	9	7	13	64	8	5 upwards	2	6	6	...	4	6	12
Hospital Ship	12	...	...	...	3	9	5 upwards	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTALS ...	2754	923	349	129	174	880	329	5 upwards	...	19	41	18	...	...	...	...	...	4	86	102	114	...	...	6	261	5	2	24	628	1,256
	2754	923	349	129	174	880	329	5 upwards	8	9	14	2	...	...	8	...	...	8	3	6	6	7	197	277	137	4	104	741	1,528	

LOCAL GOVERNMENT BOARD TABLES.

TABLE OF POPULATION, BIRTHS, AND OF NEW CASES OF INFECTIOUS SICKNESS, COMING TO THE KNOWLEDGE OF THE MEDICAL OFFICER OF HEALTH, DURING THE YEAR 1896, IN THE CARDIFF URBAN SANITARY DISTRICT, CLASSIFIED ACCORDING TO DISEASES, AGES, AND LOCALITIES.

[illegible]

Chart showing death-rate per 1,000 of the population from Zymotic Diseases during the Years 1878-1896.

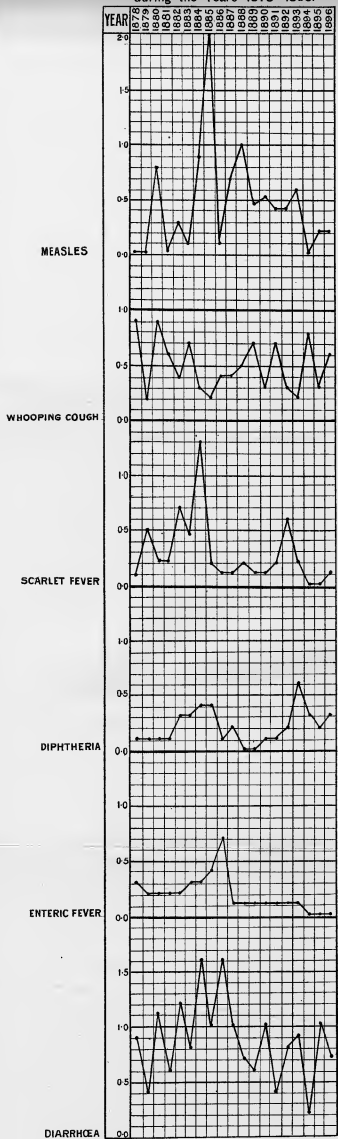
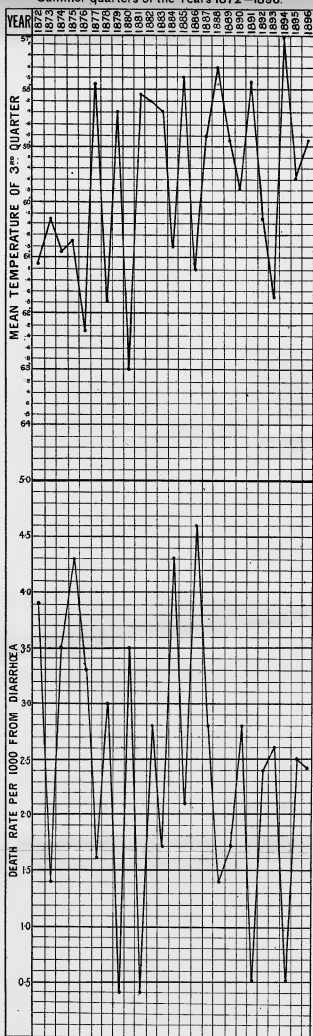


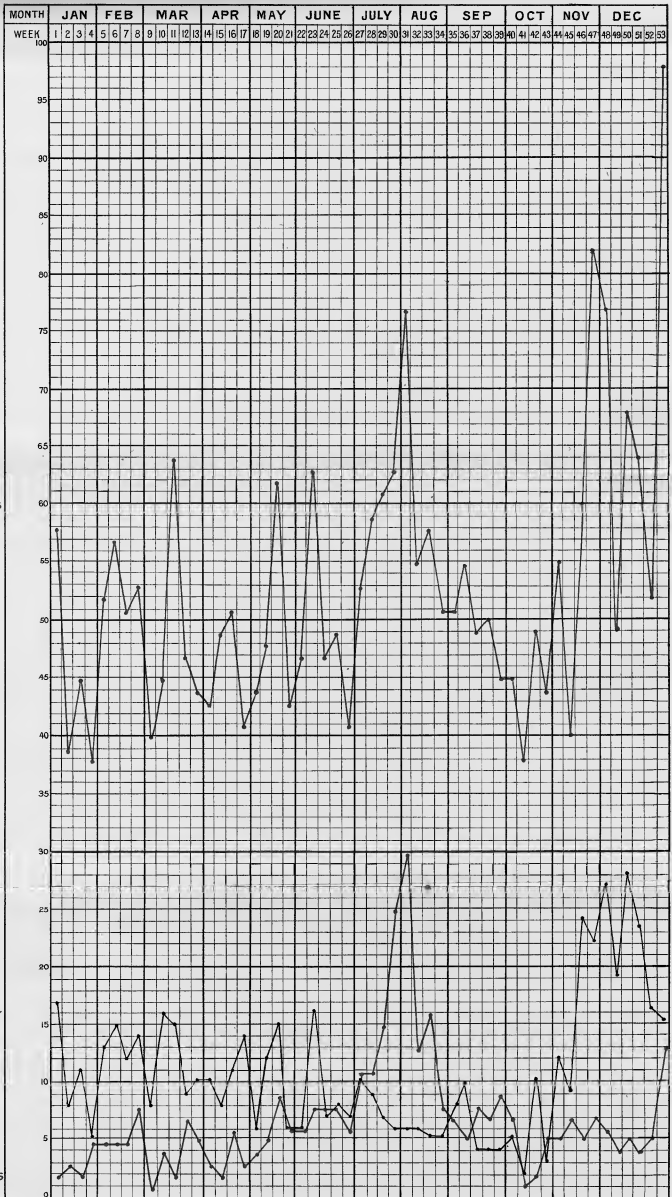
Chart showing the influence of temperature on the Diarrhoea death-rate in Gardiff, during the Summer quarters of the Years 1872-1896.



1896.

Deaths from all Causes,

Seven Chief Zymotic Diseases and Diseases of the Respiratory Organs.



Deaths from Diarrhoea, Diphtheria, Whooping Cough, Measles, Scarlatina and Enteric Fever.

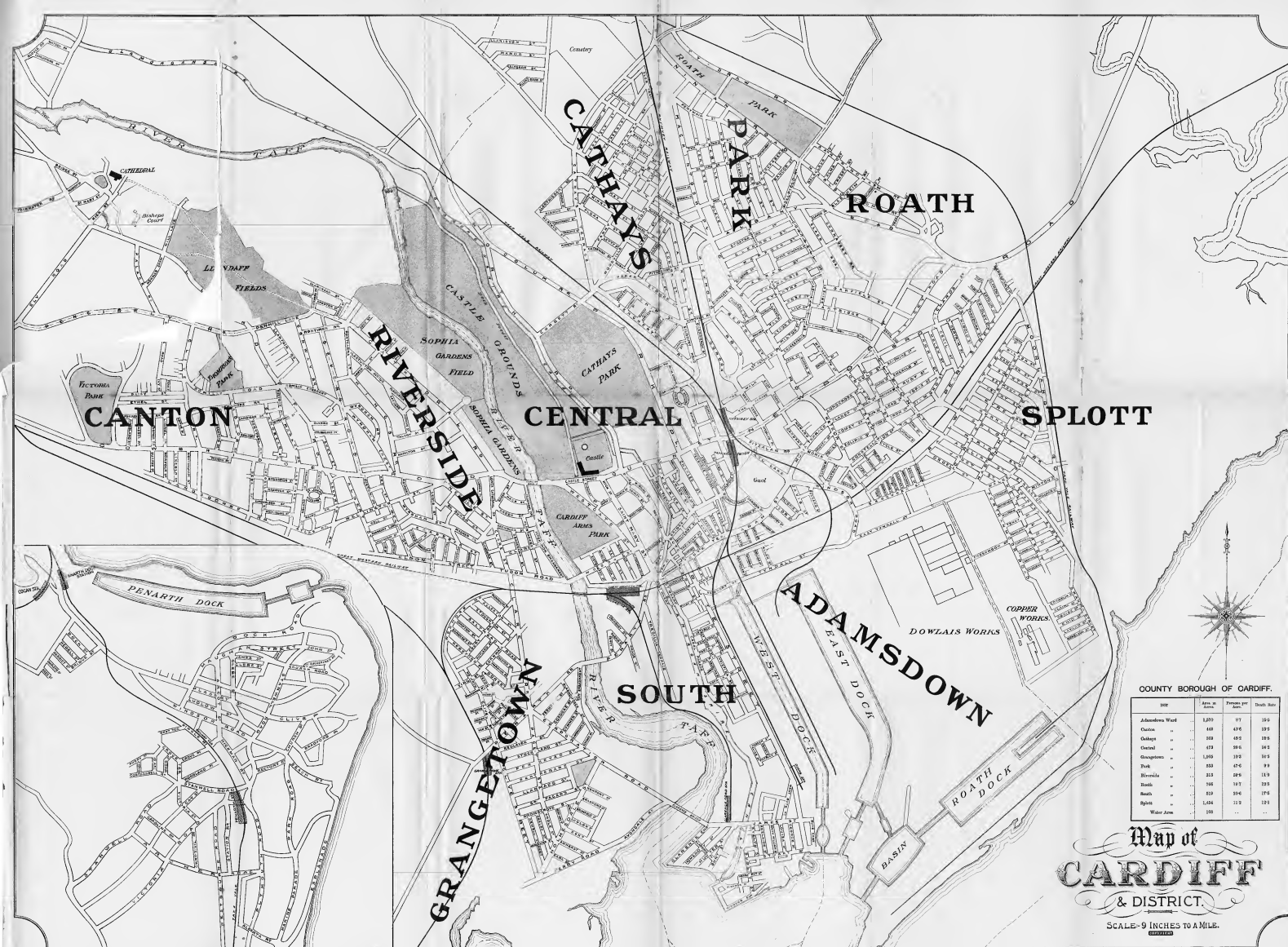


DEATHS REGISTERED AT AGES FROM THE SEVERAL CAUSES.

Estimated Population, 1896, 162,690.

Year 1896

[illegible]



COUNTY BOROUGH OF CARDIFF.

Ward	Area in Acres	Population per Acre	Death Rate
Adamsdown Ward	1,201	97	15.6
Canton	641	43.2	18.2
Grange	310	43.2	18.5
Grange	473	58.6	14.5
Grange	1,201	11.0	14.1
Roath	633	47.0	9.9
Riverside	313	10.6	11.9
South	144	14.1	10.8
South	619	10.0	17.0
South	1,034	11.0	12.1
Water Area	100	...	...

Map of
CARDIFF
& DISTRICT.

SCALE-9 INCHES TO A MILE.